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OF THE
AMERICAN SOCIETY
OF
CIVIL ENGINEERS
(INSTITUTED 1852)

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NEW YORK 1914

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ON BITUMINOUS MATERIALS FOR ROAD CONSTRUCTION: W. W. Crosby, A. W. Dean, H. K. Bishop, A. H. Blanchard, George W. Tillson, Nelson P. Lewis, Charles J. Tilden.

ON VALUATION OF PUBLIC UTILITIES: Frederic P. Stearns, H. M. Byllesby, Thomas H. Johnson, Leonard Metcalf, Alfred Noble, William G. Raymond, Jonathan P. Snow.

TO INVESTIGATE CONDITIONS OF EMPLOYMENT OF, AND COMPENSATION OF, CIVIL ENGINEERS: Alfred Noble, S. L. F. Deyo, Dugald C. Jackson, William V. Judson, George W. Tillson, C. F. Loweth, John A. Benschel.

TO CODIFY PRESENT PRACTICE ON THE BEARING VALUE OF SOILS FOR FOUNDATIONS, ETC.: Robert A. Cummings, Edward C. Shankland, Edwin Duryea, Jr., James C. Meem, Walter J. Douglas, Samuel T. Wagner, Frank M. Kerr.

ON A NATIONAL WATER LAW: F. H. Newell, George G. Anderson, Charles W. Comstock, Clemens Herschel, W. C. Hoad, Robert E. Horton, John H. Lewis, Charles D. Marx, Gardner S. Williams.

ON FLOODS AND FLOOD PREVENTION: Frank M. Kerr, John A. Benschel, T. G. Dabney, C. E. Grunsky, Morris Knowles, J. B. Lippincott, Daniel W. Mead, John A. Ockerson, Arthur T. Safford, Charles Saville, F. L. Sellow, C. McD. Townsend.

TO REPORT ON STRESSES IN RAILROAD TRACK: A. N. Talbot, A. S. Baldwin, J. B. Berry, G. H. Bremner, John Brunner, W. J. Burton, Charles S. Churchill, W. C. Cushing, Emil Gerber, Robert W. Hunt, George W. Kittredge, William McNab, G. J. Ray, F. E. Turneaure, J. E. Willoughby.

The House of the Society is open from 9 A. M. to 10 P. M. every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

HOUSE OF THE SOCIETY—220 WEST FIFTY-SEVENTH STREET, NEW YORK.

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AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed
in its publications.

SOCIETY AFFAIRS

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MINUTES OF MEETINGS OF THE SOCIETY

SIXTY-FIRST ANNUAL MEETING*

January 21st, 1914.—The meeting was called to order at 10 A. M.; President George F. Swain in the chair; Charles Warren Hunt, Secretary; and present, also, about 600 members.

Messrs. A. H. Van Cleve, J. H. Granbery, Asa E. Phillips, Frank G. Wolfe, Frederick S. Stow and Merritt H. Smith were appointed Tellers to canvass the Ballot for Officers for the ensuing year.

The Annual Report of the Board of Direction, and the Annual Reports of the Secretary and of the Treasurer†, for the year ending December 31st, 1913, were presented and accepted.

* A full report of the Sixty-first Annual Meeting is printed on pages 78 to 117 of this number of *Proceedings*.

† For these reports, see pages 11 to 22 of *Proceedings* for January, 1914 (Vol. XL).

The Committee on proposed amendments to the Constitution presented a report on a proposed amendment to Article VII, and M. T. Endicott, Past-President, Am. Soc. C. E., Chairman of that Committee, moved that this amendment be sent out to letter-ballot without change.

The motion was seconded and carried.

This amendment is as follows:

"Amend Article VII—Nomination and Election of Officers—as follows:

"Strike out Section 1, and substitute the following:"

"The Board of Direction shall, from time to time, divide the territory occupied by the membership into thirteen geographical districts, to be designated by numbers. District No. 1 shall be the territory within fifty miles of the Post Office in the City of New York. Each of the other districts shall be, as nearly as practicable, contiguous territory, and shall be designated as Districts Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13. The Board shall announce such division to the Society on or before the first day of March in each year."

Strike out the first paragraph of Section 2, and substitute the following:

"At the Annual Meeting of each year, seven Corporate Members, not officers of the Society, shall be appointed by the meeting to serve for two years. They shall be selected so as to provide, with the seven members holding over, two members from District No. 1, and one from each of the remaining twelve Districts; and these, with the five living last Past-Presidents of the Society, shall be a committee to nominate officers for the Society."

Strike out the word "and" in the fifteenth line of the third paragraph of Section 2, and after the figure "7" add: "8, 9, 10, 11, 12, and 13."

A proposed amendment to Articles V and VI was then considered, and, after discussion, the chair ruled that this amendment and another proposed amendment to Article VII, must be sent out to letter-ballot of the Society as amended by the Committee.

These amendments as amended by the Committee are as follows:

"Amend Article VII—Nomination and Election of Officers—as follows:

"Strike out Section 1, and substitute the following:"

"1.—The Board of Direction shall, from time to time, divide the territory occupied by the membership into thirteen geographical districts, to be designated by numbers. District No. 1 shall be the territory within fifty miles of the Post Office in the City of New York. Each of the other districts shall be, as nearly as practicable, contiguous territory, and shall be designated as Districts Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13. The Board shall announce such division to the Society on or before the first day of March in each year."

Section 2.—Strike out Paragraphs 1 and 2, and substitute the following:

"2.—Seven corporate members, not officers of the Society, shall be elected annually by the members in the respective districts to serve for two years. They shall be elected so as to provide with the seven members holding over, two members from District No. 1, and one from each of the remaining twelve districts and these, with the five living last past Presidents of the Society, shall be a committee to nominate officers for the Society.

The manner of election shall be as follows:

Directly after the first day of October of each year, there shall be mailed to each corporate member in each district where an election is to be held a notice with form and envelope for voting, requesting him to suggest the name of one corporate member (not an officer of the Society) from his district as a candidate for nomination for member of the nominating committee; these suggestions to be made to the Board of Direction by a preliminary letter-ballot to be received by the Board at a meeting to be held about the first of November, and opened at said meeting, and counted under the direction of the Board. The polls shall be closed at noon on the day of said meeting and the time of closing the polls shall be stated in said notice. At least thirty days before the annual meeting there shall be mailed to every corporate member, a second notice with form for voting, said notice to state the time of closing of the polls on the final ballot, and to contain as nominees for the nominating committee from each voting district the names and residences of the two persons receiving the highest number of votes in each district, and such others as may have received the same number of votes as one of these in order of their standing, and the number of votes cast for each as the result of the preliminary ballot. On the final ballot the polls shall close at noon on the day preceding the annual meeting, and the ballots shall be canvassed under the direction of the Board. The members receiving the highest number of votes in their respective districts on the final ballot shall be declared elected members of the nominating committee. Announcement of elections by this ballot shall be made at the annual meeting. In case of a tie vote in any district the annual meeting shall elect the member of the nominating committee from among the persons so tied. Vacancies in the Nominating Committee may be filled by the Board of Direction."

Paragraphs 3 and 4 of Section 2 of Article VII shall constitute a new section numbered 3, and for the words "This Committee" in the first line of Paragraph 3 substitute the words "The Nominating Committee"; and in line fifteen of the same paragraph strike out the word "and," and after the figure "7" add: "8, 9, 10, 11, 12 and 13."

Sections 3, 4, 5, 6, and 7 of Article VII shall be numbered Sections 4, 5, 6, 7, and 8, respectively.

In the second sentence of present Section 5 (new Section 6) of Article VII, insert after the word "nominated" the words "for Officers of the Society," so the said sentence shall read "This ballot shall

NOTE.—The word "district", in the 16th line of the 3d paragraph of Section 2, was not in the Committee's amendment. It has been added since the meeting by order of Hunter McDonald, President, Am. Soc. C. E. (Secretary.)

include the names and residences of all persons nominated for Officers of the Society in accordance with this Article, their grades of membership, and, in case of nominees for Directors, the number of the district in which they reside."

"Amend Articles V and VI as follows:

"Article V, Section 1.—Strike out the first sentence and substitute the following:"

"The officers of the Society shall be a President, four Vice-Presidents, eighteen Directors, a Secretary, and a Treasurer. These officers, except the Secretary, together with the five latest living Past-Presidents, who continue to be members, shall constitute the Board of Direction in which the government of the Society shall be vested, and who shall be the Trustees as provided for by the laws under which the Society is organized."

Article V, Section 2.—First Paragraph. In first sentence strike out "Secretary", so that the sentence shall read as follows:

"The terms of office of the President and Treasurer shall be one year; of the Vice-Presidents, two years; and of the Directors, three years."

Second Paragraph. In first line insert after the word "Officer" the words "elected by the Society" so that the paragraph shall read:

"The term of each officer elected by the Society shall begin at the close of the Annual Meeting at which such officer is elected, and shall continue for the period above named or until a successor is duly elected."

Article VI, Section 4.—Strike out the first two paragraphs of the section and substitute therefor the following:

"The Secretary shall be a Corporate Member of the Society. He shall be elected annually by letter-ballot of the Board of Direction, which shall be ordered not less than 20 days after the Annual Meeting.

The ballots shall be returned to tellers, appointed by the President and canvassed at a meeting of the Board. A majority of the whole Board shall be required to elect.

The Secretary shall hold office until his successor is elected, shall devote his whole time to his duties, shall be under the direction of the President and the Board of Direction, and shall be the executive officer of the Society."

Article VI, Section 6.—Strike out this Section and substitute therefor the following:

"6.—The Secretary and Treasurer shall be paid salaries to be determined by a majority of the Board of Direction, this vote to be taken by letter-ballot to be canvassed by the Board of Direction. All other salaries shall be fixed, from time to time, by the Board of Direction."

The following were appointed members of the Nominating Committee to serve two years:

LEWIS D. RIGHTS.....	Representing District No. 1		
JOSEPH R. WORCESTER.....	"	"	" 2
FREDERICK E. TURNEAURE.....	"	"	" 3
THOMAS EARLE.....	"	"	" 4
JOHN W. WOERMANN.....	"	"	" 5
THOMAS U. TAYLOR.....	"	"	" 6
MILO S. KETCHUM.....	"	"	" 7

Frederic P. Stearns, Past-President, Am. Soc. C. E., Chairman of the Special Committee on Valuation of Public Utilities, presented by title a Progress Report of that Committee, and offered the following motion:

"Resolved, That the Progress Report of this Committee, together with all discussion thereon up to September 1st, 1914, or to such later date as the Board of Direction may fix, be referred back to the Committee for further consideration; and that in the meantime the Board of Direction be requested to assign a date for the written and oral discussion on the subject."

The motion, being duly seconded, was carried.

It was moved, duly seconded, and carried that the Progress Report of the Special Committee on Valuation be not printed in *Proceedings*.

It was moved, duly seconded, and carried that the thanks of the Society be extended to the Special Committee on Valuation of Public Utilities for the very large amount of valuable work it has done on its report.

W. W. Crosby, M. Am. Soc. C. E., Chairman of the Special Committee on Bituminous Materials for Road Construction, presented by title the Report of that Committee, and offered the following motion:

"Resolved, That the Progress Report of this Committee together with all discussion thereon up to September 1st, 1914, or to such later date as the Board of Direction may fix, be referred back to the Committee for further consideration; and that in the meantime the Board of Direction be requested to assign a date for the written and oral discussion on the subject."

The motion, being duly seconded, was carried.

It was moved that the Special Committee on Bituminous Materials for Road Construction be continued for the present, but be directed to present a final report at the next Annual Meeting.

The motion was duly seconded, but was not carried.

It was moved, seconded, and carried that a vote of thanks be extended to the Special Committee on Bituminous Materials for Road Construction for its work in preparing its report.

Dugald C. Jackson, M. Am. Soc. C. E., presented the Report of the Special Committee to Investigate Conditions of Employment of, and Compensation of, Civil Engineers, and offered the following motion:

"Resolved, That the Progress Report of this Committee, together with all discussion thereon up to September 1st, 1914, or to such later date as the Board of Direction may fix, be referred back to the Committee for further consideration; and that in the meantime the Board of Direction be requested to assign a date for the written and oral discussion on the subject."

The motion, being duly seconded, was carried.

A. L. Bowman, M. Am. Soc. C. E., Chairman of the Special Committee on Columns and Struts, presented a Progress Report of that Committee.*

The report was accepted and the Committee continued.

Robert A. Cummings, M. Am. Soc. C. E., Chairman of the Special Committee to Codify Present Practice on the Bearing Value of Soils for Foundations, etc., presented a Progress Report of that Committee.†

The report was accepted and the Committee continued.

Richard L. Humphrey, M. Am. Soc. C. E., Secretary of the Special Committee on Concrete and Reinforced Concrete, presented a Progress Report of that Committee.‡

The report was accepted and the Committee continued.

It was moved, duly seconded, and carried that, in compliance with the recommendation in the report of the Special Committee on Concrete and Reinforced Concrete, that the Progress Report of that Committee presented at the Annual Meeting of January 15th, 1913, be printed in *Transactions*.

Desmond FitzGerald, Past-President, Am. Soc. C. E., Chairman of the Special Committee on Engineering Education, reported informally for that Committee.

The Committee was continued.

On motion, duly seconded, the thanks of the Society were given to the Special Committee on Engineering Education.

The Secretary announced that the Prizes, for the year ending July, 1913, had been awarded by the Board of Direction, as follows:

THE NORMAN MEDAL to Paper No. 1235, entitled "Air Resistances to Trains in Tube Tunnels", by J. V. Davies, M. Am. Soc. C. E.

THE THOMAS FITCH ROWLAND PRIZE to Paper No. 1231, entitled "The Laramie-Poudre Tunnel", by Burgis G. Coy, Assoc. M. Am. Soc. C. E.

THE J. JAMES R. CROES MEDAL to Paper No. 1222, entitled "The Problem of the Lower West Side Manhattan Water-Front of the Port of New York", by B. F. Cresson, Jr., M. Am. Soc. C. E.

* See page 103.

† See page 104.

‡ See page 105.

THE JAMES LAURIE PRIZE to Paper No. 1218, entitled "Construction of the Morena Rock Fill Dam, San Diego County, California", by M. M. O'Shaughnessy, M. Am. Soc. C. E.

The Secretary reported that the Board of Direction had appointed a Special Committee to Report on Stresses in Railroad Track, consisting of A. N. Talbot, Chairman, A. S. Baldwin, J. B. Berry, G. H. Bremner, John Brunner, W. J. Burton, Charles S. Churchill, W. C. Cushing, E. Gerber, Robert W. Hunt, George W. Kittredge, William McNab, G. J. Ray, F. E. Turneure, and J. E. Willoughby.

The Secretary read a letter* from Augustus Smith, M. Am. Soc. C. E., relative to the appointment of a Board of Arbitration for adjudicating disputes arising in engineering construction, and reported that the Board of Direction had adopted the following:

"The Board of Direction of the American Society of Civil Engineers has considered the communication of Mr. Augustus Smith concerning the appointment of an Arbitration Board, and has extensively canvassed the subject with members of the Society in various localities, some of whom have had considerable experience in arbitration matters.

"After considering the many views presented, the Board is of the opinion that arbitration of honest differences is to be recommended in preference to legal process as much as possible.

"That, however, an Arbitration Board as proposed by Mr. Smith would not be practical at the present time, nor until arbitration is more extensively practised, because of the difficulty of devising a satisfactory method of selecting competent men to membership of such a Board; further, because of the impracticability of so constituting the Board of Arbitration that it may have experts in all lines so distributed that men appointed on any given case need not be drawn from too great a distance, and further, because of the difficulty of assigning men from such a Board to the satisfaction of the disputants who may prefer persons better known to themselves."

The Secretary read a communication† from W. C. Sawyer, Assoc. M. Am. Soc. C. E., Temporary Secretary of the Los Angeles Association of Members of the American Society of Civil Engineers, in reference to the name of local associations of members of the Society, and the dues of members of such associations.

On motion, duly seconded, Mr. Sawyer's letter was referred to the Board of Direction, with power.

C. H. Higgins, M. Am. Soc. C. E., introduced the following:

"*Resolved*, That the American Society of Civil Engineers believes it to be in the public interest that the practice of engineering be regulated by statute."

On motion, duly seconded, the resolution was laid on the table.

* See page 109.

† See page 112.

The Secretary presented the Report of the Tellers appointed to canvass the Ballot for Officers for the ensuing year.

The President announced the election of the following officers:

President, to serve one year:

HUNTER McDONALD, Nashville, Tenn.

Vice-Presidents, to serve two years:

CHARLES F. LOWETH, Chicago, Ill.

GARDNER S. WILLIAMS, Ann Arbor, Mich.

Treasurer, to serve one year:

JOHN F. WALLACE, New York City

Directors, to serve three years:

GEORGE W. FULLER, New York City

ARTHUR S. TUTTLE, New York City

CHARLES H. KEEFER, Ottawa, Ont., Canada

MORTIMER E. COOLEY, Ann Arbor, Mich.

EUGENE E. HASKELL, Ithaca, N. Y.

RICHARD MONTFORT, Louisville, Ky.

Mr. Ockerson and Mr. Endicott conducted Mr. McDonald, the President-elect, to the chair.

Mr. McDonald addressed the meeting briefly.

Adjourned.

**SPECIAL MEETINGS FOR TOPICAL DISCUSSION ON
ROAD CONSTRUCTION AND MAINTENANCE**

January 23d, 1914.—The first special meeting for topical discussion on "Road Construction and Maintenance" was called to order at 10.15 A. M.; President Hunter McDonald in the chair; Arthur H. Blanchard, M. Am. Soc. C. E., acting as Secretary; and present, also, about 225 members and guests.

The discussion on the first topic, "Engineering Organizations for Highway Work", was opened by Willis Whited, M. Am. Soc. C. E., on the first sub-division topic, "State Highway Engineering Organizations". W. W. Crosby, M. Am. Soc. C. E., took the chair. William H. Connell, Assoc. M. Am. Soc. C. E., opened the discussion on the second sub-division topic, "Municipal Highway Engineering Organizations". These topics were discussed by Messrs. Charles J. Bennett, Arthur W. Dean, H. W. Durham, R. A. Meeker, Paul D. Sargent, W. W. Crosby, John C. Trautwine, Jr., E. W. James, William de H. Washington, William Goldsmith, A. T. Rhodes, I. W. McConnell, and G. A. Ricker.

Adjourned.

January 23d, 1914.—The second special meeting was called to order at 2.30 P. M.; W. W. Crosby, M. Am. Soc. C. E., in the chair; Arthur H. Blanchard, M. Am. Soc. C. E., acting as Secretary; and present, also, about 250 members and guests.

The discussion prepared by Paul E. Green, M. Am. Soc. C. E., on the topic, "Factors Limiting the Selection of Materials and of Methods in Highway Construction" was read by the Secretary. The subject was discussed further by Messrs. Samuel Whinery, George W. Tillson, Mark Brooke, W. W. Crosby, E. H. Thomes, R. A. Meeker, R. E. Beaty, W. M. Kinney, A. T. Rhodes, William de H. Washington, William Goldsmith, Paul D. Sargent, George P. Hemstreet, G. A. Ricker, D. B. Goodsell, H. W. Durham, and Alexander Blair.

Adjourned.

January 24th, 1914.—The third special meeting was called to order at 10.30 A. M.; W. W. Crosby, M. Am. Soc. C. E., in the chair; Arthur H. Blanchard, M. Am. Soc. C. E., acting as Secretary; and present, also, about 175 members and guests.

The opening discussion on the third topic, "Equipment and Methods for Maintaining Bituminous Surfaces and Bituminous Pavements", was presented by W. R. Farrington, M. Am. Soc. C. E. The topic was discussed by Messrs. Arthur H. Blanchard, Herbert Spencer, W. H. Fulweiler, and H. B. Pullar. J. A. Johnston, M. Am. Soc. C. E., took the chair, and the discussion was continued by Messrs. William de H. Washington, James H. Sturdevant, T. Hugh Boorman, and Philip P. Sharples.

Adjourned.

REGULAR MEETING

February 4th, 1914.—The meeting was called to order at 8.30 P. M.; Director T. Kennard Thomson in the chair; Chas. Warren Hunt, Secretary; and present, also, 186 members and 33 guests.

The minutes of the meetings of December 17th, 1913, and January 7th, 1914, were approved as printed in *Proceedings* for January, 1914.

A paper by Edward Flad, M. Am. Soc. C. E., entitled "Reinforced Concrete Reservoir and Coagulation Plant at St. Louis, Mo.", was presented by title, and discussed by Messrs. A. C. Janni and Edward Wegmann. The Secretary reported that he had received communications on the subject from Messrs. J. K. Finch and Alexander Potter. These were not presented on account of lack of time.

George W. Tillson, M. Am. Soc. C. E., addressed the meeting on "Some Observations on Pavements in Foreign Cities", illustrating his remarks with many lantern slides.

The Secretary announced the election of the following candidates on February 4th, 1914:

AS MEMBERS

HENRY DAVID ALEXANDER, Albany, N. Y.
THOMAS WARREN ALLEN, Washington, D. C.
CHARLES JOSEPH BENNETT, Hartford, Conn.
JOSIAH ACKERMANN BRIGGS, Jr., New York City
GEORGE CONDIT HAYDON, Kansas City, Mo.
ANDREW FULLERTON MACALLUM, Hamilton, Ont., Canada
VIRGIL GEORGE MARANI, Cleveland, Ohio
JAMES BOND POPE, San Francisco, Cal.
HERMANN FREDERICK AUGUST SCHUSSLER, San Francisco, Cal.
JACOB STEPHEN SPIKER, Vincennes, Ind.
JOHN WILLIAMS STORRS, Concord, N. H.

AS ASSOCIATE MEMBERS

OTTO WILLIAM BOERS, Chillicothe, Ill.
CHARLES BARTO BROWN, Orono, Me.
CLARK ALBERT BRYAN, Carlisle, Pa.
EDWARD CARTER CHAMBERLIN, Portland, Ore.
WILLIAM HARRISON CRAWFORD, Philadelphia, Pa.
ALLEN EDRICK ELLIOTT, New York City
HARRY FALLON HARRIS, Trenton, N. J.
OLIVER WHITCOMB HARTWELL, Albany, N. Y.
PERCY FRANCIS JONES, Milpitas, Cal.
RAYMOND BROWN KITTREDGE, Iowa City, Iowa
FRANK B KENDALL, Brantford, Ont., Canada
JAMES WALTER MARTIN, Georgetown, S. C.
BENJAMIN BALDWIN MERIWETHER, Birmingham, Ala.
JAMES CECIL MUIR, New York City
GEORGE WASHINGTON PHILIPS, Flushing, N. Y.
WALTER MITCHELL PRATT, Chicago, Ill.
WILLIAM LEROY REYNOLDS, Sheridan, Wyo.
HARRISON SMITH, Clanton, Ala.
WALTER LYNES SMITH, Ben Avon, Pa.
WILLIAM GEORGE BOLAND THOMPSON, Balboa, Canal Zone, Panama
THOMAS LEOPOLD TOMLINES, Watertown, N. Y.
ERNEST MILTON TREFETHEN, Albany, N. Y.
ROBERT HOADLEY WHIPPLE, Philadelphia, Pa.
JOHN WILKES, Nashville, Tenn.
FREDERICK CHARLES YOUNG, Iowa City, Iowa

AS ASSOCIATE

EDWARD HOFFMAN AILES, Corpus Christi, Tex.

AS JUNIORS

QUINCY CLAUDE AYRES, Greenville, Miss.
CLARENCE REED CARTER, Houston, Tex.
WILLIAM JAMES CHOUINARD, Pocatello, Idaho
CURTIS FIELDS COLUMBIA, Palmerton, Pa.
MERTON ARTHUR DARVILLE, Brooklyn, N. Y.
RICHARD DE CHARMS, JR., Darlen, Ga.
HARRY JOHN FAIRBANKS, Troy, N. Y.
ALLEN HOAR, Long Beach, Cal.
LEON DAVID HOWLAND, LaGrande, Ore.
WILLIAM JAMES HENRY MANNING, Albany, N. Y.
WARREN SHEPARD MATTHEWS, New York City
FRANKLIN RUFUS MAXWELL, Douglas, Ariz.
JOSEPH HOLLOWAY MORGAN, New York City
DAVID LEONARD NEUMAN, New York City
SAMUEL FRANK NEWKIRK, Stoneboro, Pa.
ROBERT ALDRIDGE NOWLIN, Eckman, W. Va.
HERBERT MALCOLM PIRNIE, Beverly, Mass.
WALTER CLIFFORD SADLER, Mohler, Wash.
MORTON EDWIN SOUTHER, Minneapolis, Minn.
MELVIN OLIVER SYLLIAASEN, Seattle, Wash.
HENRY TEN HAGEN, Nunda, N. Y.
FRANK MARTIN TOWNSEND, Eureka, Mont.
THEODORE LADD WELLES, JR., Wilmington, N. C.
CHARLES WILLIAM WHITMORE, Boston, Mass.
CLEMENT TEHLE WISKOCIL, Madison, Wis.

The Secretary announced the transfer of the following candidates on February 4th, 1914:

FROM ASSOCIATE MEMBER TO MEMBER

ARTHUR RAYMOND BAYLIS, New York City
WEBSTER LANCE BENHAM, Oklahoma, Okla.
HORACE COREY BOOZ, Philadelphia, Pa.
ARTHUR MAXIMILLIEN BOUILLON, Quebec, Que., Canada
GUY WHITMORE CULGIN, New York City
WALTER SCOTT GEARHART, Manhattan, Kans.
ALVIN GRAVELLE, Cleveland, Ohio
LOUIS AMEDEE GUERINGER, Victoria, Tex.
WILLIAM ALBERT HANSELL, Atlanta, Ga.
HERBERT PRESCOTT LINNELL, Manila, Philippine Islands
FRANKLYN DANA NASH, Clinton, La.
JOHN FRANCIS SULLIVAN, New York City

FROM JUNIOR TO ASSOCIATE MEMBER

THOMAS SHERWOOD BAILEY, Schenectady, N. Y.
HERBERT HERLUIN CANTWELL, Castorland, N. Y.
OMER EVERT MALSBUY, Culebra, Canal Zone, Panama
GARFIELD CHRISTIAN PETERSON, Glenbeulah, Wis.
EDWIN LORING SPRAGUE, JR., Valhalla, N. Y.
FOSTER TOWLE, St. Ignatius, Mont.

The Secretary announced the following deaths:

RICARDO MANUEL ARANGO, of Panama, Panama, elected Associate Member, September 2d, 1896; Member, February 6th, 1906; died January 24th, 1914.

JOHN WILLIS HAYS, of Petersburg, Va., elected Member, June 5th, 1901; died December 14th, 1913.

PETER ALEXANDER PETERSON, of Montreal, Que., Canada, elected Member, January 5th, 1876; date of death unknown.

WALLACE BERKLEY RIEGNER, of Philadelphia, Pa., elected Member, September 7th, 1904; died January 19th, 1914.

EDGAR HENRY MIX, of San Francisco, Cal., elected Associate Member, April 2d, 1913; died January 7th, 1914.

Adjourned.

OF THE BOARD OF DIRECTION

(Abstract)

January 21st, 1914.—The Board met, as required by the Constitution, at the House of the Society during the Annual Meeting, January 21st, 1914, at 1 p. m.; President McDonald in the chair; Chas. Warren Hunt, Secretary; and present, also, Messrs. Bush, Edwards, Endicott, Fuller, Gerber, Haskell, Hedges, Hodge, Keefer, Leonard, Lewis, Loweth, Montfort, Ockerson, Rust, Smith, Swain, Thomson, Tuttle, Wallace, and Williams.

The President announced that the first business was the election of a Secretary.

Mr. Hunt retired.

Chas. Warren Hunt was nominated for Secretary and elected.

Mr. Hunt was recalled.

The following Standing Committees of the Board were appointed:

Finance Committee: Lincoln Bush, Henry W. Hodge, Leonard Metcalf, Emil Gerber, and George W. Fuller.

Publication Committee: James H. Edwards, William Cain, Arthur S. Tuttle, Henry R. Leonard, and Gardner S. Williams.

Library Committee: J. Waldo Smith, T. Kennard Thomson, E. C. Lewis, M. E. Cooley, and Chas. Warren Hunt.

The following resolution was adopted: That mileage be allowed to all members of the Board attending the meeting of the Board at the Annual Meeting, and that this action take effect as of January 1st, 1914.

Adjourned.

February 4th, 1914.—The Board met at 3 P. M.; Vice-President Smith in the chair; Chas. Warren Hunt, Secretary; and present, also, Messrs. Bush, Edwards, Endicott, Fuller, Gerber, Hodge, Keefer, Loweth, Thomson, and Tuttle.

The following Resolutions were presented from the General Conference Committee of the five National Engineering Societies:

"Resolved: That the General Conference Committee of National Engineering Societies approves the memorial presented to the President of the United States by the American Institute of Consulting Engineers in reference to the appointment of an Engineer member of the Interstate Commerce Commission, and recommends that each of the several National Societies take such action as it may see fit in the premises."

"Resolved: That in regard to the memorial presented by the American Institute of Consulting Engineers to the Governor of New York State, and to the Mayor-elect of New York City, urging the appointment of Engineers as members of the Public Service Commissions and as heads of City Departments, the General Conference Committee does not believe it to be the province of National Engineering Societies to take up questions relating to local appointments, and the Representatives of the various National Societies are hereby requested to so report to their respective Councils for such individual action as may be necessary in the premises."

On motion, duly seconded, the Report of the Committee was received and its recommendations adopted as the action of this Board.

Messrs. George W. Tillson, Nelson P. Lewis, and Charles J. Tilden, were appointed as additional members of the Special Committee on Bituminous Materials for Road Construction.

The time for the Annual Convention to be held at Baltimore, Md., was fixed as June 2d to 5th, inclusive. Committees of Arrangements were appointed.

The evening of Wednesday, March 11th, 1914, was set down for the discussion of the Progress Report of the Special Committee on the Valuation of Public Utilities.

Ballots for membership were canvassed, resulting in the election of 11 Members, 25 Associate Members, 1 Associate, 25 Juniors, and the transfer of 6 Juniors to the grade of Associate Member.

Twelve Associate Members were transferred to the grade of Member. Applications were considered and other routine business transacted.

Adjourned.

**REPORT IN FULL OF THE SIXTY-FIRST ANNUAL MEETING,
JANUARY 21ST AND 22D, 1914**

Wednesday, January 21st, 1914 (10 A. M.)—George F. Swain, President, in the chair; Charles Warren Hunt, Secretary; and present, also, about 600 members.

Meeting called
to order.

THE PRESIDENT.—The meeting will please come to order. The first business matter to be attended to is the appointment of tellers to canvass the ballots for officers, and the President will appoint the following as tellers: Messrs. A. H. Van Cleve, J. H. Granbery, Asa E. Phillips, Frank G. Wolfe, Frederic S. Stow, and Merritt H. Smith.

Tellers
Appointed.

THE SECRETARY.—Mr. President, the ballots are all ready on the third floor with the tally sheets and the full office force to help out. There are only about 1 700 ballots, and it is hoped that the tellers will be able to get through in about two hours. If they will go right upstairs they will find all the necessary help.

Report of the
Board of
Direction.

THE PRESIDENT.—The next in the order of business is the Annual Report of the Board of Direction, which will be presented by the Secretary.

The Secretary presented the Report of the Board of Direction.*

THE PRESIDENT.—You have heard the report of the Board of Direction. What is your pleasure?

It was duly moved and seconded that the report of the Board of Direction be received and filed.

THE PRESIDENT.—Gentlemen, you have heard the motion that the report of the Board of Direction be received and filed. Those in favor please say "aye"; contrary-minded, "no". Carried.

The next business is the Report of the Secretary.

Report of the
Secretary.

THE SECRETARY.—Mr. President, this is the report of the Secretary to the Board of Direction.

The Secretary presented his Report† of receipts and disbursements for the year.

Part of that report, Mr. President, is the general balance sheet,‡ which shows the assets and liabilities of the Society, which perhaps it is not necessary to read, but which shows that the surplus, including the Reserve Fund, which would represent what the Society could sell out for, is \$644 829.57.

THE PRESIDENT.—This is a report of the Secretary to the Board of Direction, and requires no action of the Society, unless the Society desires to take some.

Report of the
Treasurer.

The next business is the Report of the Treasurer, Mr. Wallace. The Treasurer read his Report.§

* See *Proceedings*, Am. Soc. C. E., Vol. XL, p. 11 (January, 1914).

† See *Proceedings*, Am. Soc. C. E., Vol. XL, p. 20 (January, 1914).

‡ See *Proceedings*, Am. Soc. C. E., Vol. XL, p. 19 (January, 1914).

§ See *Proceedings*, Am. Soc. C. E., Vol. XL, p. 22 (January, 1914).

THE PRESIDENT.—You have heard the report of the Treasurer. What is your pleasure?

It was moved and seconded that it be accepted, and filed.

THE PRESIDENT.—It is moved and seconded that the report be accepted and filed. Those in favor of the motion, please say "aye"; contrary-minded, "no". Carried.

The next business is the report of the Committee appointed by the Annual Convention last summer to report to this Annual Meeting on certain amendments to the Constitution. This report is to be presented by the Chairman of the Committee, Mr. Endicott.

MORDECAI T. ENDICOTT, PAST-PRESIDENT, AM. SOC. C. E.—Mr. President, the report of the Committee as printed I presume has been distributed, so that all members have a copy. By referring to the last page, 10, you will notice that the report is submitted by four of the five members of the Committee. The report is not signed by Mr. C. F. Loweth. All the other members unite in the report.

Report of the
Committee on
Amendments
to the
Constitution.

One of the principal purposes of referring this matter to the Committee, as we understand it, was to harmonize the several amendments before the Business Meeting of the Annual Convention last summer, particularly those relating to the redistricting of the territory occupied by members of the Society; and, as stated in this report, some of you will recall that in the consideration of the first amendment, called the Keefer amendment, upon the first and second pages of this report, the Business Meeting at the Annual Convention expressed its approval of the first section of that amendment, that is, taking it up section by section, and at that point the question arose whether it should consider these amendments under the Keefer proposed amendments, and those proposed by O. E. Hovey and others, together, and during that discussion the matter was referred to the Committee, and we have endeavored to thrash those into line; and inasmuch as the Business Meeting had expressed its approval in substance of what we call the Keefer amendments, there being no objection to it, your Committee recommends that no amendments to this amendment be made, which apparently meets with the sanction of the Business Meeting referring the several amendments to us, and recommends that it be sent out to letter-ballot without change.

If the meeting is to consider these separately, at this stage, it is proper to consider whether it will endorse the recommendation of the Committee and send this out to letter-ballot without change. As you see, it refers to redistricting, giving us fourteen districts instead of seven, the members of the Nominating Committee remaining the same.

THE SECRETARY.—Thirteen.

Discussion on
Amendments
(continued).

MR. ENDICOTT.—Yes, thirteen. I beg pardon, No. 1 is a double-header. I move that the amendments proposed by Keefer and others shown on pages 1 and 2 of this report be sent out to letter-ballot without change.

F. P. STEARNS, PAST-PRESIDENT, AM. SOC. C. E.—I second the motion.

THE PRESIDENT.—It is moved that these amendments proposed by Keefer and others be sent out to letter-ballot without change. Those in favor of the motion say "aye"; contrary-minded, "no". Carried.

MR. ENDICOTT.—Then there were amendments proposed by Hovey and others, which were also considered by the Business Meeting to which I referred, in Ottawa. Those go into the question of whether there should be a change in the status of the Secretary with respect to the Board of Direction, and also with respect to the matter of redistricting, as to the method of the selection or election of the Nominating Committee, and it was those amendments which threw the meeting into some confusion.

The proposed Hovey amendments occur on pages 3, 4, 5, and 6. They are printed there exactly as they were laid before the Business Meeting of the Annual Convention last summer, and, beginning at page 6, and on, this Committee discusses them somewhat and states certain conditions which you have probably read.

First, the Committee recommends that these be not voted upon collectively, because the subjects treated are so very much at variance, and particularly that relating to the Secretary of the Society, which I believe should be voted on independently of all other proposed amendments. Those are Articles V and VI, referring particularly to his status and the manner of his election. Under Article V there were two amendments proposed, Section 1 and Section 2, and the Committee recommends that the amendments proposed by Hovey and others to Article V, Section 1, and Article V, Section 2, first paragraph and second paragraph, stand unchanged.

THE PRESIDENT.—And be sent out to letter-ballot?

MR. ENDICOTT.—And be sent out to letter-ballot in that form. Now, we recommend that the amendments to Article V, Sections 1 and 2, be voted upon separately. Article V, both Section 1 and Section 2, should, in our opinion, go together. I move that the amendments, Article V, Sections 1 and 2, go out to letter-ballot unchanged as recommended by the Committee.

Motion duly seconded.

THE PRESIDENT.—It is moved and seconded that, as recommended by the Committee, the proposed amendments to Article V, Sections 1 and 2, go out to letter-ballot unchanged and be voted upon together.

Those in favor of the motion say "aye"; contrary-minded, "no".

J. F. WALLACE, TREASURER, AM. SOC. C. E.—Am I privileged to ask a question?

THE PRESIDENT.—Yes.

MR. WALLACE.—I am rather confused on this. I want to know if this motion refers to the status of the Secretary or does the motion refer to the first two amendments in regard to the nomination and election of officers? Are these amendments to Articles V and VI?

THE PRESIDENT.—Article V.

MR. ENDICOTT.—The amendments to Article V only.

MR. WALLACE.—That is what I am trying to find out, what we are voting on.

MR. ENDICOTT.—Article V only.

MR. WALLACE.—I move an amendment to that motion that these amendments be referred back to the Committee with instructions that it shall report sixty days prior to the next Annual Convention.

A MEMBER.—I second the motion, that is, the amendment to the original motion I second.

THE PRESIDENT.—It has been moved and seconded that this be referred back to the Committee with instructions to report not less than sixty days prior to the next Annual Convention. Perhaps Mr. Wallace will explain the reasons for that motion.

MR. WALLACE.—Well, these amendments proposed are radical changes in the methods of handling the business of this organization. No organization as large as ours, and as successful as ours has been, can be handled without a continuity of management. The Society gets that continuity of management through a continuing Board of Direction, one-third of which is elected each year. We have got to-day a surplus of \$650 000, practically, and we are prosperous and growing; and as I have resided a short time in Missouri, I would like to be shown the necessity of any change in our policy.

This is an age of restlessness; it is an age of change; it is an era of experiments. In our political life we see to-day the Constitution of the United States, which is the flower of the best Anglo-Saxon thought for a thousand years, subjected to criticism. The tendency is to criticize, to tear apart.

I have served on the Board of Direction of your Society ten years, two as Vice-President, one as President, five as Past-President, an additional year as Past-President owing to the death of one of my predecessors, and during this last year as Treasurer, and I feel that your present methods of continuing the management of the Society, holding your Board of Direction responsible for results, have not resulted in anything that should be criticized or changed. I feel that every officer of this Society should be under that Board of Direction, should hold his office subject to that Board of Direction, and not by the popular vote of the Society.

Discussion on
Amendments
(continued).

If we could all get together on stated occasions, frequent occasions, and were not so widely scattered over the country, it might be entirely different; but if you gentlemen want to see the prosperity of this Society continued as in the past, you will make no present change in the condition of this organization. My desire to see this thing referred back is this: First, this report on which we are called to act was put out under date of January 16th. I think that before a matter of this importance should be sent out to letter-ballot it should have the ample, full, and free discussion of every member of this Society; and that is my reason not only for moving this amendment, but for urging it. (Applause.)

C. S. CHURCHILL, M. AM. SOC. C. E.—I am in full accord with the proposed action of Mr. Wallace. The organization of this Society cannot be, should not be, destroyed in the manner proposed, and I think that this vote should be taken if for nothing more than to show the sense of this Annual Meeting that we are opposed to the change.

F. W. HODGDON, M. AM. SOC. C. E.—Mr. President, I would like to ask for information. Has this report been accepted by the meeting?

THE PRESIDENT.—The report is now before the meeting for such action as the meeting may take. It has been presented.

MR. ENDICOTT.—It is being presented paragraph by paragraph, with the recommendations of the Committee, for action.

A MEMBER.—I think before we take any action we should accept the report.

THE PRESIDENT.—Do you make that motion?

A MEMBER.—I am heartily in favor of Mr. Wallace's suggestion that this whole thing be put over until the membership of the Society has had a full opportunity to know what it means. I do not think that, before the report is accepted by the meeting, we can take any action.

A MEMBER.—I understand that to be Mr. Wallace's motion, that the report be accepted and referred back.

MR. WALLACE.—My motion was an amendment on the motion to refer it back.

A MEMBER.—Your preliminary statement that the report be accepted and referred back—

MR. WALLACE.—If you will permit me, I think the most direct way to handle this would be to withdraw the motion and the amendment and then make a motion to accept the report and discharge the Committee, and then take any action that the Society desires to take on the suggestions.

A MEMBER.—The report cannot be amended or acted upon until it is received; at least, the point I make is not necessarily an acceptance of the report in its terms, because I am heartily in favor of time to understand this report. I do not understand it. Mr. Wallace, of course, knows more about it than I do, because he is on the

Board, but as an outsider, coming from a distance, the report is mysterious and uncertain to me, and therefore I am heartily in favor of referring it back, but it should be received first, before anything can be done.

MR. WALLACE.—If the gentleman who made the first motion to which mine was an amendment, will withdraw that motion, I will withdraw the amendment. I will then move that the report be received and the Committee discharged.

D. FITZGERALD, PAST-PRESIDENT, AM. SOC. C. E.—Mr. President, as there is evidently a difference of opinion in regard to this matter, in the interest of fair play, I move, sir, that this report be accepted. That is the proper way to keep the matter. Then it can be discussed. You can do what you choose with it. I move that it be accepted.

Motion duly seconded.

THE PRESIDENT.—It is moved and seconded that the report be received—

A MEMBER.—I rise to a point of order. We have already passed upon one part of it, and another part has been properly presented with the recommendation. I think it is a perfectly proper proceeding. We may decide to receive part of it, and reject part of it.

THE PRESIDENT.—The chair will sustain the point of order.

J. A. OCKERSON, PAST-PRESIDENT, AM. SOC. C. E.—It seems to me that an explanation is in order. Mr. Wallace says it is a new subject, which is presented under date of January 16th, 1914. It was presented at the Annual Convention by five members and properly signed as a proposed amendment to the Constitution. The Committee's function was to bring together two sets of amendments, so that they would be consistent with themselves and with the other portions of the Constitution, and it seems to me that the five members have a right to demand that it should go out to the Society for ballot. It is not a question of sustaining the Committee at all. It is a matter that has been properly presented, and the Society should have the right to act upon it.

MR. STEARNS.—Mr. President, I would like to say a few words more in explanation. As Mr. Ockerson has said, this is a matter that has been before the Society for some time, but the point to which I wish to call attention is this, that practically the only amendment—and this is the only change from the former language—is to put in the words "except the Secretary". Now, the Committee considered that without any regard to their own opinions, and looked at the Constitution which said that they could only amend it in a way pertinent to the proposed amendment. The amendment that they would have made, if any, would have been to strike out the words "except the Secretary". That would have left the Constitution as it

Discussion on
Amendments
(continued).

is. It evidently is not pertinent to make such an amendment as that. This matter has to go out, under the provision of the Constitution, to the members of the Society. If this motion that is made passes, it will be put off for six months. That is all it will amount to, as I understand the matter. You cannot amend a proposed amendment like that in a manner that is pertinent to the original amendment.

MR. WALLACE.—Mr. President, I was not at the Annual Convention, and I presume that is my fault; but I do not see how the interests of the Society can suffer in any way whatever by the postponement of the consideration of this question and by carrying out the suggestions embodied in my amendment. If it were something that required immediate action, if the advantages of it were so preponderant, it would be entirely another matter; but here we are purporting to take a subject, to overturn practically our entire policy, or what amounts to the same thing, in the management of this organization, and I do not see why we cannot all have proper time to do it.

There is one clause that seems to me—it may be my own fault, but I have not seen this report, which is dated January 16th—and it does seem to me that we should have plenty of time, and that no interests can be prejudiced in any way by taking six months longer to consider this proposition. All I ask is that it be referred back to the Committee, and that it be formulated, and that we have sixty days in which to consider it, and to consider it at the Annual Convention, where we always have a much larger attendance than we do at our Annual Meetings here.

MR. STEARNS.—The remarks which I made were only aimed at the futility of sending that particular thing back to the Committee. I do not intend to express any opinion in regard to the ballot. If the Society wishes, it can send it back to the Committee. In that particular respect, as a matter that in my judgment cannot be amended, it seems useless to do so.

(Cries of "Question".)

ALLEN HAZEN, M. AM. SOC. C. E.—Mr. President, as a member of this Committee, and with the prospect of having to face this matter again, I think the function of the Committee in considering it should be determined more definitely. The Constitution provides that an amendment to the Constitution may not be amended by the meeting in a way contrary to the effect of the amendment. The Constitution provides as an alternative that these matters may be referred to a Committee. I do not find anything in the Constitution which limits the scope of the consideration which the Committee may give to it. However, the Committee of which I was a member decided, after due discussion, that the Committee was limited by the same principles that limit the action of the Annual Meeting. Under that decision our only function was a literary one, to shape the language of it so

that it would be a proper part of the Constitution if it was adopted. The Committee proceeded on that basis, I think. The amendments were harmonious and put in proper shape if adopted.

I do not understand that this action of the Committee under this rule expresses any opinion of the Committee whatever, as to the advisability of the amendments. Aside from any final action, it is my judgment that a majority of the Committee was strongly against some of the amendments included in this report, and I think that fact should be duly recorded, and if the matter is referred to the Committee again, I would like to have the fact made very clear, whether it is simply a matter of language that is referred, or whether the Society desires the judgment of the Committee on the advisability of the proposed change. (Applause.)

MR. ENDICOTT.—Mr. President, I am unable to see the force or value of the proposal of Past-President Wallace, because, if this meeting sends this out to letter-ballot, it is sent out by the Board of Direction to every member of this Society, every Corporate Member, everybody who can vote upon it. He will have until next October to consider that matter. The Constitution provides that an amendment shall be voted on not later than October, I believe, following.

THE SECRETARY.—I beg pardon. I think the amendments could be voted on in March of this year, under the Constitution.

MR. ENDICOTT.—That would give them practically three months. The proper way to get it before the Society is to send it out in the form of the proposed amendment, as this meeting may amend it under its authority, and leave it in the hands of the members of the Society for two or three months, and then there is full time to consider it. I do not see any advantage at all in postponing the consideration of this matter for six months. We would be then just where we are to-day.

C. F. LOWETH, M. AM. SOC. C. E.—Mr. President, as a member of this Committee, I did not sign this report, because it seemed to me that the Committee had not gone into it with the thoroughness that should have been done. It seems to me that it was pertinent for the Committee to come before this meeting with a recommendation, and it has not done so. There are a number of these amendments that are not in such shape as they should be. They are contradictory. They do not line up with the rest of the Constitution, and it would be a very easy matter to make those amendments, to make those changes, so that if those amendments were carried they would properly fit into the Constitution. I do not believe that that has been done, and then I think it was proper and pertinent to the Committee to have made some statement in its report as to the choice of those two amendments, the one that has been offered by Mr. Keefer and the one that was offered by Mr. Hovey.

Discussion on
Amendments
(continued).

Now, they cover the same ground, and why are they put up to the membership to vote on? It is likely to make confusion. It seems to me that the Committee has not gone into its work and covered it thoroughly, as the meeting had a right to expect it to do.

T. K. THOMSON, M. AM. SOC. C. E.—Mr. President, as a member of the Board of Direction, I think I might be asked if I know anything about this proposed change. I attended most of the meetings, and I do not think there was any meeting where I could have had any chance to explain it. I got into the room too late to read it, and all I know is what I have heard.

I think any important amendment should be thoroughly discussed by the Board of Direction before being submitted to the Society. That is one reason I so strongly endorse what ex-President Wallace has just said. I might say that while I have only had the honor of being on the Board for two years, in the last twenty-one years I think I have attended more meetings than any other member of the Society, and I do not think anybody thinks we have reached perfection yet, but there has been a steady improvement right along, and it has been very marked in the last few years; and I sincerely hope you will carry out Past-President Wallace's suggestion in taking plenty of time to consider such an important matter.

(Cries of "Question".)

S. WHINERY, M. AM. SOC. C. E.—Mr. President, I wish to question the very narrow definition that has been given by some gentlemen of the word "pertinent". I do not think it was ever intended, or is now intended, or should be the rule, that the word "pertinent" should mean simply verbal constructions. Having been a member long ago of the Committee that revised the Constitution, and I think re-wrote this very section, I think I may say that certainly it was the intention of the Committee that the word "pertinent" should be defined to mean pertinent to the subject, not merely to the narrow question of the verbal construction, or not confined merely to the section of the proposed amendment. In other words, I believe that this meeting and this Society has a perfect right to deal with this matter with reference to the whole general subject, anything pertaining to this general question that has been presented to the Society; and I think in that way it is proper for this meeting to refer the question back, or the proposed amendments that relate to the general subject here treated of.

THE PRESIDENT.—It may conduce to clearness and save some time of the meeting, if I read the provisions of the Constitution with reference to this matter. The Constitution provides that:

"Amendments presented to the Secretary not less than sixty days previous to the date of the Annual Convention shall be sent by letter to the several Corporate Members of the Society, at least twenty-five days previous to the Annual Convention."

That was done last summer. "Said amendments shall be in order for discussion at the Business Meeting during such Annual Convention," Those were discussed at the Annual Convention. "and, if so amended, shall be voted upon by letter-ballot in form as amended by said Business Meeting; if not so amended * * * The vote to be counted at the first regular meeting in October."

The next paragraph refers to the fact that amendments may be brought up a short time before the Annual Convention or a short time before the Annual Meeting, and this was brought up a short time before the Annual Convention last summer—

"It may refer the amendment to a Committee for further consideration, which Committee shall report at the next general meeting, whereupon the amendment shall be voted upon as hereinbefore provided."

Now, that is just what was done at the Annual Convention. This matter was discussed. It was referred to this Committee for further consideration. This Committee has referred this report to you, and the Constitution says "whereupon the amendment shall be voted upon." The chair is of the opinion that, according to that, the recommendations of this Committee have got to go to the membership to be voted upon, and cannot be postponed. The Constitution does not say that it may be amended at this meeting even. It says that after discussion at the meeting at which amendments are properly presented, the Society, by a majority vote, may refer them to a Committee, which was done, and that Committee shall report at the next general meeting, which is this meeting; whereupon the amendments shall be voted upon as hereinbefore provided.

It appears to the chair, as I said before, that these have got to be voted upon as recommended by the Committee. The Society may vote them all down, but it appears to me—I am speaking of the way I interpret the Constitution—it appears to me they have got to go to a vote now.

W. L. SAUNDERS, M. AM. SOC. C. E.—Mr. President, may I ask if this report was presented to the Board of Direction sixty days before this meeting?

THE PRESIDENT.—It was not. It was presented sixty days before the last Convention.

MR. SAUNDERS.—I know that, but this report, as I see it, does not follow fully and strictly the previous report. This report makes certain suggestions which were amendments to those amendments. As I read this report, they do not agree in everything with the previous amendments. If that is the case, and I think it is so written here, it seems to me that having changed the previous Committee's report, that this report, after it shall have been presented sixty days before this meeting—

Discussion on
Amendments
(continued).

THE PRESIDENT.—There was no previous Committee report. The amendments were presented at the last convention. They were inconsistent with each other, and the convention got into a snarl because they were inconsistent. They were referred to a Committee. The Constitution does not provide that that Committee shall report to the Board of Direction. It says distinctly "shall report at the next general meeting," which it has done to-day, whereupon, the Constitution says, the amendments shall be voted upon as hereinbefore provided.

MR. SAUNDERS.—My point is that this report itself should have been presented to the Board of Direction sixty days before this meeting.

THE PRESIDENT.—There is nothing in the Constitution that provides that that should be done.

H. W. HODGE, M. AM. SOC. C. E.—I rise to the same point of order that the President has very plainly stated. I cannot see, under this Constitution, that this meeting can do anything with these amendments, and before I leave that point I want to say that this has been before the Board of Direction. The Board of Direction has considered it. Four out of five of the Committee have recommended it. What more can the Board of Direction do; but I submit that this motion to postpone is out of order, and I would ask the chair to so rule, and have the ballots sent out to vote.

THE PRESIDENT.—The chairman has stated very much in detail the way the matter appears to him, according to the Constitution, and I therefore rule that Mr. Wallace's motion is out of order.

MR. CHURCHILL.—Mr. President, I move that it is the sense of this meeting, this Annual Meeting, that the proposed motion or amendments to Article V, Sections 1 and 2, containing the three words "except the Secretary" are not proper and not for the interests of this Society.

A MEMBER.—I rise to a point of order there. As I understand it, the question now before the House is sending this out to a letter-ballot, and while that is a proper subject to take up later, I move it is out of order now.

THE PRESIDENT.—The chair was about to make the same ruling. The motion before the Annual Meeting is that the amendments to Article V be sent out to letter-ballot unchanged. If Mr. Churchill, later, wishes to make the motion that it is the sense of this meeting that the amendments are undesirable, that is perfectly proper, as an expression of the sense of this meeting.

F. S. CURTIS, M. AM. SOC. C. E.—I want to take exception to the President's ruling that Mr. Wallace's motion is out of order. It is true that these should be sent out by letter-ballot by this meeting to determine—and this motion was an amendment to the original motion to refer it back to the Committee. I cannot understand why that is out of order, that the Committee should reconsider and consider

further this matter, which, as I understand, the Committee is not unanimous upon in its report, and it is thrown upon us, a good many of us, who know very little about it, and we should go slow and not too fast, and I cannot quite understand why Mr. Wallace's motion is out of order, and I do not understand why you, Mr. President, should so decide.

JOHN BOGART, M. AM. SOC. C. E.—Mr. President, may I ask a question? Has the report of this Committee been read to this meeting?

THE PRESIDENT.—It is being presented paragraph by paragraph, or recommendation by recommendation, by the Chairman of the Committee.

MR. BOGART.—That I understood for the first two pages here. It was then moved, as I understand it, that that part be sent out to letter-ballot. Now, we have jumped into something else, and certainly that part has not been read, and a number of us have not these papers. I just this moment got hold of one.

THE PRESIDENT.—The Chairman of the Committee will be glad to read them if the Society desires.

MR. BOGART.—I believe we ought to have the whole thing read.

MR. ENDICOTT.—Mr. President, when I presented them first, I referred to this first part being in the hands of all, and supposed they had read it and therefore thought it was unnecessary to take it up after the meeting had read it. The amendments referred to as proposed by Hovey and others are as follows:

"Article V, Section 1.—Strike out the first sentence and substitute the following:"

You will find the original Article on page 10 of the Constitution.

MR. BOGART.—Will you explain why they are proposed?

MR. ENDICOTT.—I have already stated that the object of the amendments is to change the status of the Secretary, so that if this amendment passed hereafter he would not be a member of the Board of Direction. That is the only change proposed in Article V.

"The officers of the Society shall be a President, four Vice-Presidents, eighteen Directors, a Secretary, and a Treasurer. These officers, except the Secretary,"—that is where the amendment comes in—"except the Secretary". Those words are not in the original Constitution; those three words constitute the amendment proposed by Hovey and others. "These officers, except the Secretary, together with the five latest living Past-Presidents, who continue to be members, shall constitute the Board of Direction in which the government of the Society shall be vested, and who shall be the Trustees as provided for by the laws under which the Society is organized."

And in Article V, Section 2, First Paragraph, there is a slight amendment, which becomes necessary, if the amendment to Section 1 is passed. It says:

Discussion on
Amendments
(continued).

"The terms of office of the President and Treasurer shall be one year; of the Vice-Presidents, two years; and of the Directors, three years."

The Constitution says that the terms of the President, Secretary, and the Treasurer shall be one year. There are amendments which follow, which say that the Secretary shall serve until his successor is elected, instead of for the term of one year. So that his term of office would not necessarily be one year. That is the whole of the amendment to Article V, and the Committee has recommended first the amendments to Article V, which refers only to the membership of the Secretary in the Board of Direction.

THE SECRETARY.—There is one other change in Article VI, Section 4.

THE PRESIDENT.—The Secretary has called my attention to the fact that there is also an amendment proposed in the second paragraph of Article V, Section 2, as follows: "In first line insert after the word 'officer' the words 'elected by the Society' so that the paragraph shall read:

"The term of each officer elected by the Society shall begin at the close of the Annual Meeting at which such officer is elected, and shall continue for the period above named or until a successor is duly elected."

A. S. TUTTLE, M. AM. SOC. C. E.—Mr. President, it seems to me, speaking as one of the members, we have had this before us for quite some time. I think each individual member has given it the consideration that he ought to have given it. He has had ample time at any rate to do so, and in view of that fact, I move the question.

A MEMBER.—I rise to a question of privilege. I believe a motion to lay on the table is always in order, and I would therefore move that the motion be laid on the table.

THE PRESIDENT.—The chair will rule that motion out of order. The question before the meeting is that the proposed amendments to Article V, Sections 1 and 2, be sent out to letter-ballot unchanged.

(Cries of "Question.")

A MEMBER.—I think we are entitled to know whether the Committee is reporting as a whole on the English that is used in phrasing these amendments, or on the desirability of the matter—

THE PRESIDENT.—It is not for the Committee or the meeting to express itself as to the desirability, except informally. This meeting may later express its opinion as to whether the amendments ought to pass.

GARDNER S. WILLIAMS, M. AM. SOC. C. E.—Mr. President, under your ruling, is it necessary for this meeting to vote on the question at all? When this report is received, does not this automatically go

out to letter-ballot, and is not that the end of it? And if this meeting wants to express an opinion as to whether the amendments should pass or not it may do so. I would ask a ruling by the chair as to whether any action is necessary at this meeting. I think we are wasting time. These amendments have been properly proposed and properly acted upon by the Board of Direction, and there is nothing left under the Constitution but to send them out to letter-ballot. I would ask the chair to rule that there is no motion necessary, and that these amendments do go out to letter-ballot under the Constitution.

THE PRESIDENT.—That is the opinion of the chairman.

A MEMBER.—Inasmuch as there is some question on the chairman's rulings, does that ruling stand?

THE PRESIDENT.—The chair, then, in order to save time, will rule that the amendments proposed to the Constitution, in the form recommended by the Committee, which has just reported, now go out to letter-ballot of the Society.

MR. FITZGERALD.—Mr. President, may I beg you to consider, it is very important that we should get to a full understanding of this matter. Under your former ruling, and under the Constitution, we are obliged to vote on this matter, and we cannot send it out automatically. It is impossible. This matter is not before the meeting until it is received, and then we have got to vote on it.

A MEMBER.—I rise to a point of order. There is no motion before this meeting except the ruling of the chair; no other discussion is in order.

J. WALDO SMITH, M. AM. SOC. C. E.—I would like a ruling on one question. This Committee was appointed at Ottawa to report at the next Annual Meeting of the Society. Does that mean that this meeting has got to accept that report, and has nothing to say about it? If that is so, why does that Committee report to this Annual Meeting? It seems to me that it was referred to this Annual Meeting in order that it might be discussed, accepted, or rejected, and the chairman—the chair—does not so understand the Constitution. As the chair understands the Constitution, any amendment to the Constitution may be proposed, and if it is proposed, if it is a legitimate amendment in wording or sense, if it is proposed by five members, it has got to go to letter-ballot and nobody can prevent it from going to letter-ballot. Now, these amendments were proposed at the last Annual Convention, but it so happened that they were inconsistent with each other. The several amendments then proposed were inconsistent with each other, and manifestly they could not very well go to letter-ballot without being made consistent, and they were referred to this Committee to be made consistent, so that amendments might go to the membership which would be intelligible and consistent. This Committee has now made them consistent, and reports to this

Discussion on
Amendments
(continued).

meeting, and the Constitution says that the Committee shall report at the next Meeting, whereupon the amendments shall be voted upon.

A MEMBER.—Then let us vote upon them.

THE PRESIDENT.—It does not say voted upon by the meeting, voted upon as hereinbefore provided, by the Society by letter-ballot, not by the meeting.

H. B. SEAMAN, M. AM. SOC. C. E.—Mr. President, I feel that all discussion of this matter has been very unfortunate and will be misunderstood. It will be construed as an effort to throttle the voice of the membership. The membership controls this Society, not any body of men, nor any individual. This vote must go to the membership, and our discussion here can only be construed as an effort to throttle that vote. If that amendment is bad; it will be voted down, and the membership have sense enough to do it; and if it is good, it will go through, and the membership have sense enough to do it; and it should go to the membership and not be decided here.

THE PRESIDENT.—The ruling of the chair, that the amendments to the Constitution as reported by the Committee shall go now to letter-ballot as provided by the Constitution is challenged, and you wish to have a vote on it. It will stand as the decision of the chair.

MR. HAZEN.—Mr. President, I think it ought to be understood very clearly, beyond any possible doubt, that the Committee recommends that they go to ballot. The Committee does not recommend that they pass. It does not recommend the amendments; and that cannot be too emphatically stated.

THE PRESIDENT.—Nobody has recommended the amendments. The Committee has not recommended that they pass or that they do not pass. The Committee has simply reported them to this meeting.

MR. CHURCHILL.—I move that it is the sense of this meeting that the suggested change to Article V, Section 1, is undesirable.

Motion duly seconded.

THE PRESIDENT.—Before that is put I would simply state that I understand that the ruling of the chair not having been challenged, these amendments now go to letter-ballot in the form now recommended by the Committee.

MR. CURTIS.—I move an appeal from the President's decision. I understand that the President of this Society says that we have nothing whatever to say about it except by letter-ballot. It is brought up before this meeting for consideration. Now, why? Why was it brought up? Why say anything about it at all? Why did not the President go ahead and order it sent out, and not bring it before this meeting. It is brought before us. I think we have a right to say something about it, as to whether it shall go out, or whether it shall not go out, and I move—as I have already said, I do not want to go

against our President, because I think very much of him—I move an appeal from his decision.

Motion duly seconded.

THE PRESIDENT.—That is a perfectly proper motion for Mr. Curtis to make.

D. C. JACKSON, M. AM. SOC. C. E.—This is not a parliamentary question; it is a constitutional question; and the vote of this meeting has nothing to do with a constitutional question. The literal statement of the Constitution as to that is that this Committee, which is now reporting, shall report to this meeting, and thereupon the amendments proposed shall go to letter-ballot. That ends it. This meeting can say nothing more about it.

THE PRESIDENT.—The chair believes that Professor Jackson is right, and I am very much perplexed as to what the situation would be if the decision should be overruled, because, in my opinion, we would then be proceeding in an unconstitutional manner. (Laughter.) Shall the decision of the chair be sustained? Those in favor please hold up their hands. Those against. The decision of the chair is sustained. The amendments themselves will go to letter-ballot in the form recommended, all of them in the form recommended by the Committee.

THE SECRETARY.—Exactly in the form?

THE PRESIDENT.—In the form recommended by the Committee.

HUNTER McDONALD, M. AM. SOC. C. E.—Pardon me for calling attention to the omission of one word in this report, which if it should go out in that way, would cause a great deal of misunderstanding. About the middle of page 9 it appears that the—

MR. ENDICOTT.—We are not considering the portion you mention.

MR. McDONALD.—I would like to have the phraseology changed by the Committee.

THE PRESIDENT.—You cannot change it.

MR. WALLACE.—The President has decided that this report shall go to letter-ballot. Therefore it is improper for us to discuss it in any way whatever. We will never get anywhere. We are simply wasting our time.

MR. DAVIS.—I cannot see how it is out of order for this meeting to recommend something to the membership.

THE PRESIDENT.—Not at all. The motion before the Society is that of Mr. Churchill, whose motion is that in the opinion of this meeting the recommendations—I am not quite clear as to whether he means to cover Article V. Will you please state your motion.

MR. CHURCHILL.—That the suggested change to Article V, Sections 1 and 2, are undesirable.

Motion seconded.

THE PRESIDENT.—It is moved and seconded that, in the opinion

Discussion on
Amendments
(continued).

of this meeting, the amendments to Article V, Sections 1 and 2, are undesirable. Is there any discussion on that? Those in favor of the motion say "aye"; contrary-minded; "no". The chair is in doubt.

A MEMBER.—Will the chair please explain what the motion is.

THE PRESIDENT.—The changes in the Constitution contemplated by these amendments—

A MEMBER.—All of them?

THE PRESIDENT.—Article V, Sections 1 and 2. The motion, which was not conclusively settled by the *viva voce* vote, is this, that in the opinion of this meeting it is not desirable that the suggested amendments to Article V, Sections 1 and 2, should pass. Is that correct, Mr. Churchill?

MR. CHURCHILL.—Yes, sir.

THE PRESIDENT.—We were about to take a vote on that. Is there any one who does not understand that? You are not in order, later perhaps. Is there any misunderstanding on that?

A MEMBER.—Have I not any right to speak on that at all?

THE PRESIDENT.—No; the discussion is closed. Those in favor of that motion, that the amendments to this Article are undesirable, will please raise their hands. Those opposed.

THE SECRETARY.—90 to 122.

THE PRESIDENT.—It is not a vote. The motion is lost. The next business is the appointment of the Nominating Committee; Report of the Secretary regarding the Final Suggestions which have been received from the Seven Geographical Districts.

MR. J. WALDO SMITH.—There are some other articles.

THE PRESIDENT.—All those articles go to ballot.

MR. J. WALDO SMITH.—Then I would like to make a motion, if I may. At the Ottawa Convention there was a protest presented, signed by some 800 members of this Society, scattered throughout the length and breadth of the country, protesting against the amendments, the Hovey amendments affecting the standing of the Secretary, and also the manner of electing the Nominating Committee. In order that the general membership of this Society may have the benefit of the opinion of those people as expressed in their protest, I move that, when these amendments are sent out to letter-ballot, a copy of this protest with the signers accompany the letter-ballot.

THE PRESIDENT.—Was not that protest printed in the Proceedings of the Ottawa Convention? It has already been before the Society, Mr. Smith.

MR. J. WALDO SMITH.—In order that that may be particularly called to their attention, I make that motion.

Motion duly seconded.

MR. HODGE.—I strongly object to this meeting—I am not talking about the value of these amendments. Some of them may be desirable,

and some may not, but I do say that the Constitution does give the membership the right to an unbiased vote. The membership are entitled to an unbiased vote, and to send out the views of any side to this controversy I think is a mistake. Our membership are brilliant men, and I do not think that either side of this small meeting—600 members out of 6 000—should try to send out their views as to how the membership should vote. Let them vote their own way.

MR. ENDICOTT.—I hope that the proposition will not prevail. I think it would be a most dangerous precedent for this Society to set, that it could send out *ex parte* statements to influence the vote of the membership on questions of this kind.

THE PRESIDENT.—It has been duly moved by Mr. Smith, and seconded, that a statement opposing the adoption of certain amendments be sent out with the amendments. Those in favor of the motion will please say "aye"; contrary-minded "no". It is not a vote.

The next is suggestions regarding the Nominating Committee.

MR. SEAMAN.—Mr. President, I am told that we voted on a question as to the opinion of the members present that these amendments should not prevail, and many of us did not know whether we were voting for it or against it. I think the motion should be put again in the form that it is the sense of this meeting that these amendments should prevail, and let that go out.

THE PRESIDENT.—The chair rules that out of order. The question was clearly put; the question was asked if every one understood what he was voting on, and the vote was lost.

The Secretary will present the Report of the Nominating Committee. Shall we take this up by districts?

THE SECRETARY.—I beg leave to report a count of the final suggestions received from members in the several districts expressing their choice for the member of the Nominating Committee to be appointed from each, as follows:

Nominating
Committee.

Total suggestions received from all districts, 1 946.

District No. 1: Total number of suggestions received, 407, as follows:

Lewis D. Rights.....	229
Ernest P. Goodrich.....	101
Charles J. Parker.....	74
Walter F. Whittemore.....	1
Ralph H. Chambers.....	1
William J. Wilgus.....	1

A MEMBER.—I move that Mr. L. D. Rights be named as a member of the Nominating Committee from District No. 1.

Motion seconded.

Nominating
Committee
(continued).

THE PRESIDENT.—It is moved and seconded that Mr. L. D. Rights be a member of the Nominating Committee from District No. 1. Those in favor of the motion say "aye"; contrary-minded, "no". It is carried.

THE SECRETARY.—District No. 2: Total number of suggestions received, 230, as follows:

Joseph R. Worcester.....	86
Charles M. Spofford.....	71
Richard S. Lea.....	58
John C. Moses.....	14
Joseph H. O'Brien.....	1

A MEMBER.—I move that Mr. J. R. Worcester be named as a member of the Nominating Committee from District No. 2.

Motion seconded.

THE PRESIDENT.—It is moved and seconded that Mr. J. R. Worcester be a member of the Nominating Committee from District No. 2. Those in favor of the motion say "aye"; contrary-minded, "no". It is carried.

THE SECRETARY.—District No. 3: Total number of suggestions received, 245, as follows:

Frederick E. Turneure.....	103
Frank R. Lanagan.....	100
William H. Yates.....	40
William S. Bacot.....	1
Henry N. Ogden.....	1

MR. WILLIAMS.—I move that Mr. Frederick E. Turneure be selected as a member of the Nominating Committee from District No. 3.

Motion seconded.

THE PRESIDENT.—It is moved and seconded that Mr. Frederick E. Turneure be a member of the Nominating Committee from District No. 3. Those in favor of the motion say "aye"; contrary-minded, "no". It is carried.

THE SECRETARY.—District No. 4: Total number of suggestions received, 308, as follows:

Thomas Earle.....	136
Richard L. Humphrey.....	97
Arthur P. Davis.....	70
Logan W. Page.....	1
John E. Greiner.....	1
Arthur W. Thompson.....	1
Charles O. Vandevanter.....	1
A. C. Shand*.....	1

* Not a member.

A MEMBER.—I move that Mr. Thomas Earle be selected as a member of the Nominating Committee from District No. 4.

Motion seconded.

THE PRESIDENT.—It is moved and seconded that Mr. Thomas Earle be a member of the Nominating Committee from District No. 4. Those in favor of the motion say "aye"; contrary-minded, "no". It is carried.

THE SECRETARY.—District No. 5: Total number of suggestions received, 246, as follows:

John W. Woermann.....	66
John W. Alvord.....	60
William L. Breckinridge.....	59
Alexander Maitland, Jr.....	46
Webster Gazlay.....	14
John V. Hanna.....	1

A MEMBER.—I move that Mr. John W. Woermann be named as a member of the Nominating Committee from District No. 5.

Motion seconded.

THE PRESIDENT.—It is moved and seconded that Mr. John W. Woermann be a member of the Nominating Committee from District No. 5. Those in favor of the motion say "aye"; contrary-minded, "no". It is carried.

THE SECRETARY.—District No. 6: Total number of suggestions received, 223, as follows:

Thomas U. Taylor.....	69
James N. Hazlehurst.....	66
John F. Coleman.....	52
Walton P. Darwin.....	22
Paul H. Norcross.....	11
Harry O. Cole.....	1
Howard N. Eavenson.....	1
James C. Nagle.....	1

A MEMBER.—I move that Mr. Thomas U. Taylor be named as a member of the Nominating Committee from District No. 6.

Motion seconded.

THE PRESIDENT.—It is moved and seconded that Mr. Thomas U. Taylor be a member of the Nominating Committee from District No. 6. Those in favor of the motion say "aye"; contrary-minded, "no". It is carried.

THE SECRETARY.—District No. 7: Total number of suggestions received, 287, as follows:

Milo S. Ketchum.....	123
William C. Hammatt.....	96
Clifford S. MacCalla.....	61

Nominating
Committee
(continued).

Ralph M. Conner.....	1
Homer Hamlin.....	1
Frank C. Horn.....	1
Joseph B. Lippincott.....	1
William Mulholland.....	1
Charles D. Vail.....	1
R. H. Thomson.....	1

A MEMBER.—It is moved that Mr. Milo S. Ketchum be named as a member of the Nominating Committee from District No. 7.

Motion seconded.

THE PRESIDENT.—It is moved and seconded that Mr. Milo S. Ketchum be a member of the Nominating Committee from District No. 7. Those in favor of the motion say "aye"; contrary-minded, "no". It is carried.

Report of
Committee on
Valuation of
Public
Utilities.

The next business in order is the Report of the Special Committee on the Valuation of Public Utilities, Frederic P. Stearns, Chairman.

MR. STEARNS.—Mr. President and members of the Society. The report of the Special Committee on the Valuation of Public Utilities is signed by six of the seven members. Mr. Henry M. Byllesby, who is a member of the Committee was unable to take any part whatever in its deliberations, and said that he was even unable to read the drafts that had been sent to him, and he therefore requested that his name be omitted. That is not a case of opposition on his part, so far as he has expressed himself. This report covers a good many fields of an intricate subject, and it would be useless to think of reading it or any part of it. Similarly, I believe, it would be useless in a meeting of this sort to discuss it; and at the suggestion of some members, and in accordance with my own views, if the report is before the Society, I would like to offer this motion.

THE PRESIDENT.—Please read it.

MR. STEARNS.—"*Resolved*, That the Progress Report of this Committee, together with all discussion thereon up to September 1st, 1914, or to such later date as the Board of Direction may fix, be referred back to the Committee for further consideration; and that in the meantime the Board of Direction be requested to assign a date for the written and oral discussion of this subject."

MR. WILLIAMS.—I second the motion.

THE PRESIDENT.—It is moved and seconded that this be passed. Is there anybody who wishes it re-read? It is moved that this progress report, together with the written discussion, be referred back to the Committee, and that in the meantime the Board of Direction assign a date for the written and oral discussion on the subject.

A MEMBER.—I second the motion.

THE PRESIDENT.—It has been seconded. Is there any discussion?

Those in favor of the motion please say "aye"; contrary-minded, "no". It is carried.

THE SECRETARY.—As a matter of information I should like to ask whether it is the intention of this resolution not to publish any of this discussion. Our usual method would be to publish it as it came in, in *Proceedings*. It was not intended to shut that off?

MR. STEARNS.—Not in the least. I suppose that written discussions would be published from time to time, so that all the members of the Society would have the benefit of it. The idea was to initiate a date a considerable way in the future, so as to give ample time for the discussion of this important subject, and that the Committee might have the advantage of these discussions so that it might amend the report if it saw fit to do so.

A MEMBER.—Mr. President, I move that inasmuch as each member of the Society has a copy of that report, that it be not published in the *Proceedings* until the final report of the Committee is issued.

Motion duly seconded.

THE PRESIDENT.—It is moved and seconded that, inasmuch as every member of the Society now has in his possession a copy of this report, it be not published until it is published in the form finally arrived at by the Committee. Is there any discussion?

J. N. CHESTER, M. AM. SOC. C. E.—May I add to that, that copies of this report shall not be given out to parties not members of the Society?

THE PRESIDENT.—That can be a later motion.

A MEMBER.—That can be added to the motion, if the original maker agrees.

THE PRESIDENT.—Will you please state that again?

MR. CHESTER.—That copies of this report shall not be given out, so far as it is in the power of the Society and its officers to prevent it, to parties not members of the Society; that no parties not members of the Society shall be furnished with a copy of the report.

THE PRESIDENT.—You mean by the Society?

MR. CHESTER.—By the Society or its officers or members.

THE PRESIDENT.—That amendment is accepted.

MR. WILLIAMS.—Mr. President, it seems to me that this resolution is one of questionable policy. In the first place, I suppose a large number will have mislaid the report. I think it should be published in the *Proceedings*. I think there is nothing in here that should be kept secret. It is a progress report. We want the members of this Society to discuss it, and I think we want persons who are not members of this Society to discuss it, too. I do not believe that the American Society of Civil Engineers wants to keep under the bushel the work that it is doing, even during its progress, and I sincerely hope this motion will not prevail.

Report of
Committee on
Valuation
(continued).

A MEMBER.—While I agree with the motion—my remarks have been brought out by finding this report in a Public Service Commissioner's hands, and he was using it on the supposition that it was the actual report of this Committee, not a progress report at all. Now, if what Mr. Williams says are the sentiments of the meeting, let it be made clear that this is only a progress report, subject to further amendment before it is adopted.

THE PRESIDENT.—The motion before the meeting is that, inasmuch as every member of the Society has received a copy of this report, it be not printed in the *Proceedings*, until it is presented in its final form by the Committee.

A MEMBER.—I agree with Mr. Williams thoroughly, and, as a member of the Committee, I feel that all of us should have the benefit of everybody's comments on this subject. There is no objection whatever to making it evident that it is only a progress report, and that it has not been accepted in any way by the Society, if that can be made plain; but we do not want to be tied up, as Mr. Williams said, and hide our work under a bushel. It should be made public to everybody, the attorneys who deal with this subject should give us the benefit of their judgment upon it.

THE PRESIDENT.—Are you ready for the motion?

MR. STEARNS.—I move a division of that question. I am not opposed to deferring its publication in the *Proceedings*, although I think it may be questionable whether that is desirable, but the other motion, that no report shall be sent out to anybody outside of the membership of the Society, I think is very unwise. There are some people from whom we wish to get discussions, and the report has already been sent to them. There are some to whom we wish to give the benefit of what the Committee has done.

MR. CHESTER.—I will withdraw that, under the conditions stated, that it is a progress report, and not absolutely final.

MR. STEARNS.—I have nothing to say, if that part of the motion is withdrawn.

THE PRESIDENT.—It is withdrawn. The motion is that it be not printed in the *Proceedings* until it is printed in the proper form. Those in favor say "aye"; contrary-minded, "no". Carried.

MR. WALLACE.—If it would be in order, I would like it if the Committee would explain why, in the valuation of railway property, it heads its report "For the purposes of rate-making"?

THE PRESIDENT.—Will Mr. Stearns answer that question?

MR. STEARNS.—Mr. President, the Committee is not a Committee for the valuation of railway properties; in accordance with its title, it is for railway property and other public utilities. The amount of work involved in this report was enormous. It seemed as if we would never get it out, and so, as we believed that valuation for purchase and

sale, valuation for taxation, and valuation for other questions were not identically the same, we decided to limit this report to one side of the question, namely, the valuation for the purposes of rate-making. That is the most comprehensive kind of valuation, and brings up the greatest number of questions, so that we thought we would do the most good by taking up that branch of the subject first.

A MEMBER.—While there may be some question of doubt as to the different purposes that underlie these matters of valuation, I think there can be no doubt whatever in the minds of every member of the Society who has seen the preliminary report as to the enormous amount of work that the Special Committee has done, and I think that the Society owes to the Committee an appreciation of the tremendous amount of work it has done.

Motion seconded.

THE PRESIDENT.—It is moved and seconded that the thanks of the Society be extended to this Committee for the very large amount of very valuable work it has done on this report. All in favor of the motion please say "aye"; contrary-minded, "no". Carried.

The next business is the report of the Special Committee on Bituminous Materials for Road Construction, W. W. Crosby, Chairman.

W. W. CROSBY, M. AM. SOC. C. E.—Mr. President, as the report of the Committee has been printed, and is rather long, I would like to present the report by title, and if Mr. Stearns will allow me to profit by the resolution which he introduced, by the resolution in support of his Committee, I would like to offer the same resolution.

THE PRESIDENT.—You have heard the motion by the Chairman of the Committee that the same action that was taken with reference to the previous report be taken with reference to this report. Is the motion seconded?

Motion duly seconded.

THE PRESIDENT.—Are you ready for the question?

MR. WHINERY.—Mr. President, inasmuch as this Committee has been in existence for five years, and has rendered annual reports, I think, inasmuch as these committees are usually appointed to get a definite answer or a definite opinion on certain subjects at the time, and as I believe that the continued existence for years and years, of these special committees, is not in the best interests of the Society, I move that this Committee be continued and directed to submit a final report at the next Annual Meeting.

THE PRESIDENT.—A final report, do you mean?

MR. WHINERY.—A final report.

THE PRESIDENT.—Mr. Whinery moves that the Committee be continued for the present, but be directed to bring in a final report at the next Annual Meeting. Is the motion seconded?

Motion duly seconded.

Report of
Committee on
Bituminous
Materials for
Road
Construction.

Report of
Committee on
Bituminous
Materials
(continued).

MR. CROSBY.—Much as I dislike to make a point of order against Mr. Whinery, I believe there is a resolution before the House which antedates his. I should like to say a word on Mr. Whinery's motion when the proper time arrives, but having made the point of order I want a ruling on it.

THE PRESIDENT.—The gentleman's point of order is correct. The motion that the same action be taken as was taken with reference to the previous report, was not decided. Those in favor of taking the same action on this report that was taken with respect to the previous report say "aye"; contrary-minded, "no". Carried.

Now Mr. Whinery's motion is that the Committee be continued for a year, but requested to bring in a final report at the next Annual Meeting.

MR. CROSBY.—The Committee has fully realized from the beginning the force of what Mr. Whinery has stated, and has endeavored to bring this matter to a conclusion; but, in the present state of this subject, it has found it extremely difficult each year to present a final report on many of the questions. The Committee intended during the coming year to work even harder, in order to bring in a final report. It is rather difficult to foresee whether that is possible or not, as the Committee has recently been in communication with the Board of Direction, I presume partly with the same purpose in view. I think that it might be wise not to discourage or to limit the activities of the Committee by directing that their energies cease during the coming year.

There are many questions which are now being investigated, and which will take time for settlement; and though it is possible that all of this will be completed within the coming year, to my mind it is hardly probable. I simply wish to make that statement in connection with Mr. Whinery's motion.

THE PRESIDENT.—Are you ready for the question? The motion was duly made and seconded? Are you ready for the question? The motion is that the Committee be continued for a year and requested to bring in a final report at the next Annual Meeting. Those in favor of the motion say "aye"; contrary-minded, "no". The chair believes it is not carried. Do you wish a showing of the hands, Mr. Whinery? Those in favor of the motion please raise the hand.

THE SECRETARY.—Twenty-six.

THE PRESIDENT.—Those opposed. It is not carried.

A MEMBER.—What is the status of the Committee? Is it discontinued?

THE PRESIDENT.—The Committee continues. The Committee is in existence, but has not been directed to bring in a final report next year as was the purpose of the motion.

A MEMBER.—I am not quite clear whether Mr. Crosby's motion included a vote of thanks to the Committee for its work? If not, I

move that a vote of thanks be extended to the Committee for its work.

Motion seconded.

THE PRESIDENT.—It is moved and seconded that the thanks of the Society be extended to this Committee for its work in preparing this report. Those in favor of the motion please say "aye"; contrary-minded, "no". Carried.

The next is the Report of the Committee to Investigate Conditions of Employment of, and Compensation of, Civil Engineers, Alfred Noble, Chairman. Will Professor Jackson present the report.

Report of
Committee on
Employment
and
Compensation
of Civil
Engineers.

MR. JACKSON.—I refused to sign the report, although I think it is a very valuable one, and the investigation is a very valuable one; but I refused to sign it for the reason that the average presented was a too optimistic statement of the circumstances under which engineers work, and for the reason that the minimum presented so pessimistic a situation that we ought to investigate that part of it. I therefore move that Mr. Stearn's motion be applied to the report of this Committee, and that the report be not printed in the *Proceedings* or *Transactions* until the Committee has had an opportunity to investigate part of it, and has made a final report.

Motion duly seconded.

THE PRESIDENT.—You heard the motion. I presume it is not necessary to have it repeated. Those in favor say "aye"; contrary-minded, "no". It is carried.

THE PRESIDENT.—The report of the Committee on Steel Columns and Struts, A. L. Bowman, Chairman. In order that the speakers may be heard, it is very desirable that we preserve quiet as far as possible.

Report of
Committee on
Columns
and Struts.

A. L. BOWMAN, M. AM. SOC. C. E.—This report is under date of December 15th, 1913.

DECEMBER 15TH, 1913.

The Special Committee, "to consider and report upon the design, ultimate strength, and safe working values of Steel Columns and Struts," presents the following report of progress:

The proposed programme of column tests which is being made for the Society by the Bureau of Standards of the U. S. Government, S. W. Stratton, Director, has been somewhat delayed owing to the rigid specifications and the pressure of business in the steel mills, but the Committee is glad to report that seventy columns have been fabricated and delivered in Washington to date, and that some twenty of these have already been tested. The testing is being done on the new 2 300 000-lb. testing machine which has recently been built for the Bureau of Standards at Washington.

From conferences with the sub-committee on Iron and Steel Structures, of the American Railway Engineering Association, Mr. W. H.

Report of
Committee on
Columns
and Struts
(continued).

Moore, Chairman, we learn that the Bureau of Standards has in progress for them a correlated programme of steel column tests. These tests will assist materially in interpreting the results of our own programme.

At the October meeting of the Board of Direction, Mr. James H. Edwards was appointed a member of the Committee, to fill the vacancy caused by the death of Mr. Alfred P. Boller.

Awaiting the completion of the tests now under way, your Committee makes this progress report.

Committee:

AUSTIN LORD BOWMAN,
J. H. EDWARDS,
E. GERBER,
CHAS. F. LOWETH,
RALPH MODJESKI,
FRANK C. OSBORN,
GEO. H. PEGRAM,
LEWIS D. RIGHTS,
GEO. F. SWAIN,
EMIL SWENSSON,
J. R. WORCESTER.

For the Committee:

AUSTIN LORD BOWMAN,
Chairman.
LEWIS D. RIGHTS,
Secretary.

MR. BOWMAN.—I might state that these columns are now being tested by the Bureau of Standards, at Washington, D. C.

A MEMBER.—I move that the report be received and placed on file. Motion seconded.

THE PRESIDENT.—It is moved that the report be received and placed on file. It has not been previously presented. Those in favor of the motion say "aye"; contrary-minded, "no". Carried.

Report of
Committee on
Bearing Value
of Soils.

The Report of the Committee to Codify Present Practice on the Bearing Value of Soils for Foundations, Robert A. Cummings, Chairman.

Mr. Cummings presented the following:

JAN. 20TH, 1914.

TO THE AMERICAN SOCIETY OF CIVIL ENGINEERS:

Your Special Committee appointed by the Board of Direction "to codify present practice on the bearing value of soils and to report upon the physical characteristics of soils in relation to engineering structures" respectfully submits the following Report of Progress.

Since its appointment your Committee has given careful thought to its subject. In the first place, a schedule of questions and a circular letter have been prepared inviting co-operation by those possess-

ing information concerning tests and data from existing structures and customary local practice. The preparation of a bibliography has also been commenced.

Regarding the second phase of the subject, your Committee recognizes that the classifying and correlating of the soils of the United States is of the utmost importance, and must be its first consideration. To this end a great deal of time has been taken up by the examination of technical literature. This is expected to furnish the basis for a satisfactory classification.

Your Committee has received assurances from U. S. Bureau of Standards and U. S. Bureau of Mines, of their active interest and offer of co-operation of these branches of the Federal Government in a scientific investigation of the physics of soils.

In consequence of the importance of the subject and the incompleteness of the data on hand your Committee can do no more than report progress at this time and requests its continuance.

ROBERT A. CUMMINGS, *Chairman*;
W. J. DOUGLAS,
J. C. MEEM,
SAMUEL TOBIAS WAGNER,
E. C. SHANKLAND,
F. M. KERR.

THE PRESIDENT.—You have heard the report of the Committee. What is your pleasure?

A MEMBER.—I move that it be received and placed on file.
Motion duly seconded.

THE PRESIDENT.—Gentlemen, you have heard the motion. Those in favor please say "aye"; contrary-minded, "no". Carried.

The Report from the Special Committee on Concrete and Reinforced Concrete, Joseph R. Worcester, Chairman.

RICHARD L. HUMPHREY, M. AM. SOC. C. E.—Mr. Chairman, Mr. Worcester is not here.

"PHILADELPHIA, PENN., January, 1914.

"To the President & Members of the
American Society of Civil Engineers,
220 West Fifty-seventh St., New York.

"Your Special Committee on Concrete and Reinforced Concrete has nothing at present to add to the report which it presented at the last annual meeting. While it is not complete, there being a number of developing points or details upon which a further report may be desirable and to which your Committee is giving consideration, it is not likely that it will have anything in shape to present to the Society for some considerable time. Your Committee would recommend that this report be printed in the *Transactions* so as to reach many who do not receive or keep the *Proceedings*.

Report of
Committee on
Concrete and
Reinforced
Concrete.

Report of
Committee on
Concrete and
Reinforced
Concrete
(continued).

"In view of the fact that matters connected with the art are now developing and under consideration, your Committee suggests that it be continued, with the understanding that it will not be expected to present a report until it has reached further conclusions.

"Respectfully submitted in behalf of the Committee.

"J. R. WORCESTER,

"Chairman,

"RICHARD L. HUMPHREY,

"Secretary."

THE PRESIDENT.—You have heard the report of the Committee, gentlemen. What is your pleasure?

A MEMBER.—I move that the report be received and placed on file, and the Committee continued.

Motion seconded.

THE PRESIDENT.—That would be done automatically. Those in favor please say "aye"; contrary-minded, "no". Carried.

What is your pleasure with reference to the recommendation of the report, that the report of the Committee be printed in the *Transactions*? The Committee recommends that a previous report, as I understand it, this previous full report be printed in the *Transactions*, the report presented at the last Annual Meeting.

A MEMBER.—I make that motion.

Motion duly seconded.

THE PRESIDENT.—It is moved and seconded that the report of this Committee at the last Annual Meeting, which was a very full report, be printed in the *Transactions*, as recommended by the Committee today. Any discussion? All those in favor of the motion please say "aye"; contrary-minded, "no". Carried.

The report of the Special Committee on Engineering Education, Desmond FitzGerald, Chairman.

Report of
Committee on
Engineering
Education.

MR. FITZGERALD.—Mr. Chairman and Gentlemen: I had the honor of presenting a verbal report on the subject of Engineering Education. As the time is passing rapidly, and as this is a very important subject, I should like to have the opportunity of amplifying it to a certain extent later, but I will give you the gist of the position of the Committee at the present time. For the last two years we have been endeavoring to get the Carnegie Foundation to begin its long promised work in the matter of making a thorough study of engineering education, and we have been very much disappointed, Mr. President, to find that at the end of two years nothing could be done.

Feeling that this Society especially was anxious that something should be done, or some explanation given, the Committee prepared a carefully written report on the subject of Engineering Education, giving their own views, the views which they had arrived at after five years of careful study and investigation, as far as possible, on this important subject.

This written report, Mr. President, covers almost all the debatable grounds which have been brought up within the last few years, in regard to the methods of treating engineering education. It treated of the matter of discipline, and recognized the importance of that portion of engineering education. It treated of the matter of special courses; it treated of the matter of physical training, of the introduction of more English, of the graduation of the student with a better knowledge of his own counts. It treated comprehensively, as far as it could, of those subjects, and now at the last moment it has been determined by the Committee not to present this report. Why? Because since January 2d, last, the whole matter has changed.

The clouds that obscured the sky have passed away. The Carnegie Foundation have explained why they have not undertaken the work in the last two years, and they have given us written promises, written notes, stating that they will begin just as soon as they can organize the office and find the proper man to whom to entrust the important work. I hold in my hand a copy of the resolution of that important meeting, which took place here in New York on January 2d, and that will explain to you why—knowing that that committee meeting was coming off—that will explain to you why we held our own report back, and why we finally determined to await the result of a more important investigation.

THE PRESIDENT.—Will those in the rear be so good as to maintain quiet as far as possible, so that the report may be heard.

MR. FITZGERALD.—I do not intend to burden you with reading the whole of this report, but I should like to say that the Carnegie Foundation for the advancement of teaching have voted as follows:

"First.—The Board of Directors of the Foundation has authorized the making of a thorough study of engineering education;

"Second.—The Foundation will pay all expenses attendant upon making the study;

"Third.—The study will be under the supervision of the Foundation in consultation with this Committee, this Committee naming not only the Committee that now appears before you as the Committee of this Society, but also committees of all the other engineering societies, and all societies for the promotion of engineering education;

"Fourth.—The report embodied the result of the studies that will be published by the Foundation, and final decision with reference to matters to be included therein will rest with the Foundation."

The rest of the resolution treats of the methods of conducting the work. You will see, gentlemen, from this, that although it may be true, as has been stated here, this is a period of restlessness, a period of change, yet that does not imply that change in itself means retrogression. Who is there of us that believes all within the great maelstrom that is going on at the present day, every change is not going to produce progress, that men are not going to be benefited by that change?

Report of
Committee on
Engineering
Education
(continued).

Almost any current is better than stagnation, and we feel as a Committee that this work now, this important work of making a thorough study in the schools themselves and of studying the results and judging the results by the character, the abilities, the attainments, and the work of the graduates of these schools, will result probably in bringing before the schools some method of improving methods of study.

This may be true. We hope devoutly that it will be true, that it will come about in that way. Now, gentlemen, however important all of our own personal interests at the present day may appear to us, there is little doubt in my mind, and I believe in the minds of the committee that has been studying this matter, that we are on the eve of the greatest change in engineering education. We believe that the foundations of that structure have been laid so deep and that they have already attained such strength and power that they are going to produce in the very near future a structure before which all other methods of education must bow their heads in acknowledgment of superiority.

There is no doubt in the minds of our Committee, I think, that engineering education is advancing by such leaps and bounds that in a very short time, comparatively, it will absorb such a large amount of the scientific, literary, and intellectual products of thought of this century that it will be the wonder of the world.

The education for theology, for jurisprudence, for the sciences, will be almost a pigmy in comparison, and we, as engineers, I think, should feel some of the responsibility that goes with that enormous progress and development. I ask you, gentlemen, now to continue this Committee in order that we can aid the Carnegie Foundation by consultations, for a year or two longer, until we can watch their results.

A MEMBER.—I move that the report be received and filed.

Motion seconded.

THE PRESIDENT.—You have heard the remarks of Mr. FitzGerald. The Committee presents no formal report, but will be automatically continued.

W. DE H. WASHINGTON, ASSOC. M. AM. SOC. C. E.—I think, Mr. Chairman, that a vote of thanks for the important work of this Committee will be certainly due to them.

Motion duly seconded.

THE PRESIDENT.—It is moved and seconded that the thanks of the Society be extended to this Committee. Any discussion? Those in favor will please say "aye"; contrary-minded, "no". Carried.

Reports from the Board of Direction by the Secretary. What has the Secretary to present?

Award of
Prizes.

THE SECRETARY.—I am instructed by the Board of Direction to state that Messrs. Charles M. Spofford, Daniel W. Mead, and Walter Loring Webb, were appointed a Committee to Recommend the Award

of Prizes for the year ending July, 1913. That after this Committee had reported, the Board of Direction has awarded the Prizes as follows:

THE NORMAN MEDAL to Paper No. 1235 entitled "Air Resistances to Trains in Tube Tunnels" by J. V. Davies, M. Am. Soc. C. E.

THE THOMAS FITCH ROWLAND PRIZE to Paper No. 1231 entitled "The Laramie-Poudre Tunnel" by Burgis G. Coy, Assoc. M. Am. Soc. C. E.

THE J. JAMES R. CROES MEDAL to Paper No. 1222 entitled "The Problem of the Lower West Side Manhattan Water-Front of the Port of New York" by B. F. Cresson, Jr., M. Am. Soc. C. E.

THE JAMES LAURIE PRIZE to Paper No. 1218 entitled "Construction of the Morena Rock Fill Dam, San Diego County, California" by M. M. O'Shaughnessy, M. Am. Soc. C. E.

THE PRESIDENT.—This report of the Board of Direction is simply presented for the information of the Society.

THE SECRETARY.—At the June 4th, 1913, Meeting of the Society, the following Resolutions were passed:

"That it is the sense of this meeting that the American Society of Civil Engineers should appoint a Special Committee to act jointly with the American Railway Engineering Association in studying and experimenting on the stresses in railroad rails, ties, etc.," and

Special
Committee on
Stresses in
Rails, Ties, etc.

"That the matter of appointing this Committee be left with the Board of Direction with full power."

I have the honor to state that the following Committee to report on this subject has been appointed by the Board:

A. N. TALBOT, *Chairman*, A. S. BALDWIN, J. B. BERRY, G. H. BREMNER, JOHN BRUNNER, W. J. BURTON, CHARLES S. CHURCHILL, W. C. CUSHING, E. GERBER, ROBERT W. HUNT, GEORGE W. KITTREDGE, WILLIAM McNAB, G. J. RAY, F. E. TURNEAURE, J. E. WILLOUGHBY.

THE SECRETARY.—I am instructed by the Board to report the following:

On July 2d, 1913, Augustus Smith, M. Am. Soc. C. E., addressed a communication to the President, which he in turn presented to the Board of Direction for consideration.

"BAYONNE, N. J.,
"JULY 2ND, 1913.

"PROF. GEORGE F. SWAIN.

"*Pres. American Soc. C. E.,*
"Harvard Univ., Boston, Mass.

"Dear Sir:—I have read, with extreme satisfaction, your Annual Address and regret that I was prevented from hearing it at Ottawa.

"Engineers and the American Society of Civil Engineers have the greatest opportunities open to them in public work for Engineering

Proposed
Appointment
of an
Arbitration
Board.

Proposed
Appointment
of an
Arbitration
Board
(continued).

involves Leadership in every sense. The Engineer has to deal with nature in making his plans and with man in the execution thereof. Until an Engineer is equally at home when weighing the forces of nature or the motives of men, he has not reached his full growth.

"Encouraged by views so well expressed in your address, I am writing to obtain your opinion of the practicability of a vision that I have long cherished that the American Society of Civil Engineers would establish a Judiciary Department for adjudicating disputes arising in engineering construction.

"My idea, roughly, is to create an Arbitration Board of 50 to 100 men to which corporate members would be elected to fill vacancies caused by death or retirement, on the regular letter ballot, with the other Officers of the Society, when vacancies in the Arbitration Board existed. The Board would be filled by a certain number of engineers from each District.

"The services of this Board would be available to any disputants making proper application to the Society therefor, whether or not said disputants were represented by Membership in the Society.

"A Bench of three members of the Arbitration Board would be assigned to hear and judge of each such case; the selection of the particular three judges assigned to a given case being made by some power created within the Arbitration Board. The disputants would have no voice in the selection of the judges.

"A schedule of fixed fees depending on the number of hearings, or the number of witnesses or the quantity of evidence, or, perhaps, on the amount involved, would be provided to compensate the arbiters assigned to a case.

"I see the following advantages of such a Board:

"1. It would provide a Court competent to hear and in sympathy with the matters of dispute that arise in construction work. No jury would be necessary. Few 'expert' witnesses would be called.

"2. The delay and much of the expense incident to invoking the State or U. S. Courts will be eliminated.

"3. The expense and vexatious delays and the technicalities that seem to be inevitable in an actual trial in the established Courts would be greatly reduced.

"4. The difficulty of obtaining 'Arbitrators' where each side selects his own Arbitrators or where both sides try to agree on one Arbitrator will be done away with.

"5. The money paid for such litigation will be kept in the profession.

"6. An election to the Arbitration Board will be an honor second only to that of President of the Society, to be looked forward to by the older members of the Society. As the Society increases in numbers, there will be a growing need of additional Society Honors for, on numerical reasons, few can possibly be rewarded by election to the Presidency.

"7. An Arbitration Board would increase the power and prestige of the Society and would expand its usefulness to the public.

"It might be urged that the decisions of such a Board could not be enforced. I do not think that this will nullify the usefulness of its work for the following reasons.

"1. Decisions of all of the Public Courts, except the Supreme Court, are not final but can usually be appealed. Yet, how few cases are carried to the Supreme Court.

"2. Most disputes that cannot be settled by the parties themselves arise from a sense of personal injury or slight. The disputants get mad. They must get a decision from an outside source. I believe that an intelligent sympathetic opinion from an impartial bench of competent men in their line of business in whose selection they had no part will go further to give 'satisfaction' than the usual Court Decision which frequently betrays lack of appreciation of the essentials involved and too often is a mere compromise.

"3. Better minds would be on such a Bench as the Arbitration Board would provide than are usually found on the Court Benches, to which Judges are too often elected or appointed by questionable methods. Few disputants are so bitter that they will not listen to 'Reason' when Reason really talks.

"4. Few would care to risk the unpopularity that would result by disregarding the decision of a Bench of the Arbitration Board of the American Society of Civil Engineers.

"5. There are successful precedents for such a Board in the Board of Governors of the New York Stock Exchange; in the Arbitration Committee of the New York Chamber of Commerce; in the Court-martials of the Army and of the Navy; in the Regatta Committee of any Yacht Club and in the By-Laws of nearly every Club or fraternity.

"I hope that you will consider such a Board within the sphere of usefulness of the American Society of Civil Engineers and will call on me to do whatever you think I can do towards promoting its organization forthwith.

"Yours respectfully,

"AUGUSTUS SMITH."

THE SECRETARY.—I am instructed by the Board to report to the Society that, having given this subject careful consideration, the following was adopted by the Board at its meeting of December 3d, 1913:

"The Board of Direction of the American Society of Civil Engineers has considered the communication of Mr. Augustus Smith concerning the appointment of an Arbitration Board, and has extensively canvassed the subject with members of the Society in various localities, some of whom have had considerable experience in arbitration matters.

"After considering the many views presented, the Board is of the opinion that Arbitration of honest differences is to be recommended in preference to legal process as much as possible.

"That, however, an Arbitration Board as proposed by Mr. Smith would not be practical at the present time, nor until arbitration is more extensively practised, because of the difficulty of devising a satisfactory method of selecting competent men to membership of such a Board; further, because of the impracticability of so constituting the Board of Arbitration that it may have experts in all lines so distributed that

Proposed
Appointment
of an
Arbitration
Board
(continued).

men appointed on any given case need not be drawn from too great a distance, and further, because of the difficulty of assigning men from such a Board to the satisfaction of the disputants who may prefer persons better known to themselves.

That is all I have from the Board, sir. I have another communication that I will read, a letter from W. C. Sawyer, Assoc. M. Am. Soc. C. E.

“626 So. HOPE ST., LOS ANGELES, CAL.
Dec. 26, '13.

“MR. CHAS. WARREN HUNT,
“*Sec'y Am. Soc. Civ. Engr's.*

Local
Associations,
etc.

“DEAR SIR:—I respectfully suggest that you bring before the members at the Annual Meeting for discussion the matter of changing the name of the local associations to something shorter.

“Allow me also to suggest that you discuss at that meeting the possibility of refunding to local associations 10% to 25% of the dues received from such members as are affiliated with such associations.

“As an alternative, though less desirable from our viewpoint, the dues might be raised \$5.00 applicable to all members living within one hundred miles of the headquarters of a local branch.

“The members of all grades living within such circle should thereby become active members of the local associations. The members might be given opportunity to pay the five dollars direct to the local treasurer of the local association, but upon failure to do so they should be collected by the parent society under usual conditions and refunded. This would greatly strengthen the local organizations. Of course a certain number of applicants should be necessary before such an association could be formed under such conditions. It might also be optional upon the part of local associations whether they would adopt such conditions.

“These are my personal suggestions which have not been acted upon by our association.

“We were all very much disappointed at missing a visit from you but enjoyed having Mr. Metcalf present. Our Annual Meeting will be held Jan. 5, '14, at which time the results of letter ballot election of permanent officers will be announced.

“Yours truly,

“W. C. SAWYER, *Temp. Sec'y.*

THE PRESIDENT.—The Chairman must insist that there be quiet at the rear of the room. You have heard this communication that the writer desires to have brought before the Society? What is your pleasure?

JAMES OWEN, M. AM. SOC. C. E.—I move that it be referred to the Board of Direction with power.

Motion seconded.

THE PRESIDENT.—Is there any discussion on the question? Those in favor of the motion please say “aye”; contrary-minded, “no”. The motion is carried.

The Secretary informs me that the Report of the Tellers is not quite ready, and will not be ready for some ten minutes. You may, therefore, introduce any new business if any member desires to do so.

C. H. HIGGINS, M. AM. SOC. C. E.—Mr. President, I have a motion to introduce, the subject matter of which has been so widely discussed that no introduction is necessary. I move that the Board of Direction be and hereby is directed to submit to the membership by letter-ballot before the Annual Convention the following resolution:

"Resolved, That the American Society of Civil Engineers believes it to be in the public interest that the practice of engineering be regulated by statute."

Resolution
Relating to
Regulation of
Practice of
Engineering.

I submit this motion.

THE PRESIDENT.—Gentlemen, you have heard the motion. Is it seconded?

Motion duly seconded.

THE PRESIDENT.—The motion has been seconded. Any discussion of the motion? The motion is that the Board of Direction submit to the membership by letter-ballot the question which the member will please read once more.

MR. HIGGINS.—*"Resolved, That the American Society of Civil Engineers believes it to be in the public interest that the practice of engineering be regulated by statute."*

A MEMBER.—That that be the sense of the meeting? I believe that the form would have to be changed to be legal.

THE PRESIDENT.—The Secretary suggests that perhaps you do not understand the motion, which is, that the Board of Direction send out this question to ballot, so that the members can express themselves. Please read the resolution once more.

MR. HIGGINS.—*"Resolved, That the American Society of Civil Engineers believes it to be in the public interest that the practice of engineering be regulated by statute."*

THE PRESIDENT.—The motion is that the Board of Direction be, and hereby is directed to submit to the membership by letter-ballot the resolution already read, and that it be so submitted before the next Annual Convention; and the members will have an opportunity to vote aye or no in regard to the motion.

MR. STEARNS.—Mr. Chairman, I hope that this motion will not pass. It has not been before any committee or before the Board of Direction, and I do not think we should take such summary action.

THE PRESIDENT.—Any further discussion?

L. C. WASON, M. AM. SOC. C. E.—Mr. President, I would like to suggest that the statutes of every State differ from one another, and it would lead to endless trouble. If there is any recommendation at all, I should think it would be for the National Government to enact

Regulation of
Practice of
Engineering
(continued).

such legislation, so that it would be uniform throughout the United States; and, if the motion is carried, it should have some such rider as that.

A MEMBER.—Mr. Chairman, I move that the motion be laid on the table.

Motion duly seconded.

THE PRESIDENT.—It is moved and seconded that the motion be laid on the table. Those in favor of the motion please say "aye"; contrary-minded, "no". Carried.

F. H. NEWELL, M. AM. SOC. C. E.—The Special Committee on A National Water Law, composed of members in various parts of the United States, has not yet been fully organized, but, if it is appropriate, I will ask that the President request that the members who are here meet after the meeting.

THE PRESIDENT.—The Chairman of the Committee on A National Water Law, recently appointed by the Board of Direction, requests that all members here meet with him in the Secretary's office, or in the office opposite the Secretary's office, at the adjournment of this meeting. Is there any other new business?

THE SECRETARY.—Mr. President, in connection with the resolution which was just offered and laid upon the table, I think it may be of interest to the members of the Society to know that a Joint Committee composed of representatives from each of the five National Engineering Societies has been instructed—that the representatives of each have been instructed—by their several Boards to prepare the draft of a bill for the registration of engineers.

The primary object of this work was to head off vicious legislation which has appeared in one or two States. In a secondary way we know that such legislation is pending, and it is the intention to produce a draft of a bill which will be unobjectionable at all events to the Profession; and a great many believe that if such a bill were adopted in a State like New York that other States would follow very soon. As a matter of fact, the State of Pennsylvania has already appointed a Commission of three engineers to study the subject and report next November. That bill, as I happen to be on that committee, I know is practically ready for reporting back to the governing bodies of each of these five National Engineering Societies, and should it receive the endorsement of the governing bodies of those societies I think it will come pretty near becoming a law.

W. G. FEDERLEIN, ASSOC. M. AM. SOC. C. E.—Regarding the proposed bill, what has been stated may be true, but this Society has never expressed its opinion upon the question of whether the members want legislation of that kind or not. I therefore make a motion that the motion made by Mr. Higgins be taken off the table and reconsidered.

THE PRESIDENT.—It is moved that the motion of Mr. Higgins, which was laid on the table, be taken from the table. Is the motion seconded?

MR. WILLIAMS.—I rise to a point of order. There has been no business transacted by this body since the making of that motion, and therefore the motion is not in order.

THE PRESIDENT.—The motion has not been seconded. The Secretary now has the report of the Tellers. You will please listen to the report.

THE SECRETARY.—The Tellers appointed to canvass the ballots for officers of the Society for 1914 report as follows:

Ballot for
Officers.

Total number of ballots received.....	1 729	
Ballots without signature.....	19	
" stamped, not signed.....	5	
" from members in arrears of dues.....	6	
<hr/>		
Total number not entitled to vote.....	30	
<hr/>		
Ballots canvassed.....	1 699	
 <i>For President:</i>		
HUNTER McDONALD.....	1 694	
Scattering	5	
 <i>For Vice-Presidents:</i>		
CHARLES F. LOWETH.....	1 678	
GARDNER S. WILLIAMS.....	1 668	
Scattering	18	
 <i>For Treasurer:</i>		
JOHN F. WALLACE.....	1 693	
Scattering	4	
 <i>For Directors:</i>		
District No. 1. {	GEORGE W. FULLER..... 1 645	
{	ARTHUR S. TUTTLE..... 1 631	
{	Scattering	9
District No. 2. {	CHARLES H. KEEFER..... 1 638	
{	Scattering	2
District No. 3. {	MORTIMER E. COOLEY..... 1 638	
{	EUGENE E. HASKELL..... 1 634	
{	Scattering	16
District No. 5. {	RICHARD MONTFORT..... 1 639	
{	Scattering	9

Election of
Officers.

THE PRESIDENT.—Gentlemen, you have heard the report of the Tellers. I would therefore declare that Mr. Hunter McDonald has been elected your President for the coming year, and that you have elected as Vice-Presidents Mr. Charles F. Loweth and Mr. Gardner S. Williams; for Treasurer Mr. John F. Wallace; for Directors from District No. 1, Messrs. George W. Fuller and Arthur S. Tuttle; from District No. 2, Mr. Charles H. Keefer; from District No. 3, Messrs. Mortimer E. Cooley and Eugene E. Haskell; from District No. 5, Mr. Richard Montfort.

The time has now come, gentlemen, for me to lay down the duties which you imposed upon me a year ago and to introduce to you my successor in office; and in doing so I wish to express to the membership of the Society one and all, the deep sense of the honor you did me a year ago and my thanks for the courtesy and kindness which you have shown me during the year, notwithstanding my many deficiencies.

I will ask Mr. Ockerson and Admiral Endicott to escort the President-elect to the chair.

Remarks by
President
McDonald.

HUNTER McDONALD, PRESIDENT, AM. SOC. C. E.—Fellow members of the American Society of Civil Engineers, the Secretary has suggested to me that a few extemporaneous remarks might be proper on this occasion, but anticipating that the temper of this meeting might be somewhat belligerent in view of the discussion which I knew was coming, I thought it more prudent to reduce my remarks to writing, and if you will excuse me I will present them.

I once heard a distinguished lawyer addressing a body of engineers declare that the members of the profession were paid less than any person he knew in proportion to the value of their services and the time and expense required to properly equip them for their work. He said that the only way he could account for their zeal and devotion to their profession was that he thought they enjoyed the chase more than the killing. All of us are in search of and enjoy to the fullest extent the honor and satisfaction resulting from the enthusiastic discharge of duty, and to many of us it is the only reward.

Success has been so universal that the public has grown to regard engineering accomplishment as a matter of course. Failure means oblivion. Many of us find ourselves in the position similar to that of a small boy whose duty it was to work the garden. A stranger passing one day saw him leaning disconsolately on his hoe and gazing into the beyond. The stranger said, "Son, do you work here?" "Yes, sir," was the reply. "What pay do you get for it?" "Nothing if I do and a licking if I don't."

Fortunately that is not the situation of all of us. To one in seven thousand members once each year comes the highest honor which can be conferred upon an engineer. Though there may be many who are worthy, the natural limitations are such that only a few can attain it.

It is not given to us to know whether our being in at the death is due to our staying qualities or to a fortunate short cut.

However this may be, matters not to the one who is chosen. I value the honor more than any possible commercial reward. I trust your confidence has not been misplaced, and promise to give my best efforts toward the welfare of this Society, watchful always of its dignity and respecting its traditions. I thank you. (Great applause.)

THE SECRETARY.—Mr. President, so far as the Secretary is concerned, there is no further business. I would suggest, however, sir, that announcement be made, or I can make it, that a meeting of the Board of Direction will be held in the Secretary's office, in the Board Room, rather, at the front entrance of the house, at 1 o'clock, and that all members of the Board are asked to be there promptly, so that the new Board may organize.

Mr. President, for several years, three I think, the luncheon which was served in this house was discontinued, due to the fact that we had such a large attendance when the luncheon was announced that we could not very well serve the people that came. At every Annual Meeting that luncheon has been asked for vociferously, and this year the Committee decided to do the best it could and so a very simple luncheon has been provided, consisting largely of sandwiches and lemonade, and it is hoped that everybody will get something at least, and the Board probably can eat enough before one o'clock to satisfy them.

THE PRESIDENT.—My first official action is to declare the meeting adjourned.

Adjourned.

EXCURSIONS AND ENTERTAINMENTS AT THE SIXTY-FIRST ANNUAL MEETING

Wednesday, January 21st, 1914.—After the Business Meeting, lunch for about 770 members was served at 1 p. m. at the Society House.

At 2.30 p. m., through the courtesy of the Public Service Commission for the First District, Alfred Craven, M. Am. Soc. C. E., Chief Engineer, and the contractors for the various sections of the new subways below Prince Street, Manhattan, about 300 members, made an inspection trip through several portions of the Broadway subway and the tunnels under St. Paul's Churchyard and Vestry Building.

At 9 p. m. there was a reception, with dancing, at the Hotel Astor, at which the attendance was 740.

Thursday, January 22d, 1914.—The day was devoted to an excursion to the Martin's Creek and Tunkhannock Viaducts, now in course of construction by the Delaware, Lackawanna and Western Railroad, George J. Ray, M. Am. Soc. C. E., Chief Engineer. The party of about 450 assembled at Hoboken, N. J., at 8.15 a. m., and the trip was made on a special train. Lunch was served on the train, through the courtesy of the contractors on the bridge work.

The new viaducts are on the new change of line which the Lackawanna Railroad Company is building between Clark Summit and Hallstead, Pa., which line, when completed, will reduce materially the operating costs between these points. The excursion also afforded an excellent opportunity to inspect the long New Jersey Cut-off previously constructed by this company.

The special train was provided with a wireless telegraph outfit and was in communication with New York and Scranton.

The train left Nicholson, Pa., at about 2.30 p. m., and arrived in Hoboken at 6.30 p. m.

In the evening, at the Society House, there was a social and informal "Smoker," at which the attendance was about 800.

The following list contains the names of 999 members of various grades who registered as being in attendance at the Annual Meeting. The list is incomplete, as some members failed to register, and it does not contain the names of any of the guests of the Society or of individual members. The number of guests is estimated at about 400.

Abbott, C. P.	White Plains, N. Y.	Allen, F. W.	White Plains, N. Y.
Adams, E. E.	New York City	Allen, Kenneth.	New York City
Aiken, W. A.	Philadelphia, Pa.	Alison, T. H.	Bayonne, N. J.
Aims, W. I.	New York City	Allison, J. E.	St. Louis, Mo.
Alexander, H. J.,		Alsberg, Julius.	New York City
	White Plains, N. Y.	Ammann, O. H.	New York City
Allaire, D. A.	Brooklyn, N. Y.	Appleton, T. A.	Beverly, Mass.
Allardice, E. R. B.	Clinton, Mass.	Armstrong, R. S.	New York City

- Armstrong, R. W. . . . New York City
 Arnold, W. H. . . . New York City
 Ashbaugh, L. E. . . . New York City
 Atkinson, A. . . . New Brunswick, N. J.
 Atwood, T. C. . . . New Haven, Conn.
 Atwood, W. G. . . . Indianapolis, Ind.
 Auryansen, F. . . . Jamaica, N. Y.
 Babcock, W. S. . . . New York City
 Backes, W. J. . . . New Haven, Conn.
 Baird, H. C. . . . New York City
 Baker, E. B. . . . Herkimer, N. Y.
 Bamford, W. B. . . . Belmar, N. J.
 Banks, C. W. . . . Pleasantville, N. Y.
 Barbour, F. A. . . . Boston, Mass.
 Barker, C. W. T. . . . Philadelphia, Pa.
 Barnes, M. G. . . . Albany, N. Y.
 Barnes, T. H. . . . New York City
 Barnett, R. P. . . . New York City
 Barney, P. C. . . . Brooklyn, N. Y.
 Barney, W. J. . . . New York City
 Basinger, J. G. . . . New York City
 Beach, W. N. . . . New York City
 Bean, G. L. . . . Philadelphia, Pa.
 Beaty, R. E. . . . New York City
 Becker, R. C. . . . New York City
 Beebe, J. C. . . . Havre, Mont.
 Beekman, J. V., Jr. . . Boston, Mass.
 Belcher, W. E. . . . New York City
 Belknap, F. W. . . . New York City
 Bellows, S. R.,
 West New Brighton, N. Y.
 Belzner, Theodore. . . New York City
 Benedict, F. N. . . . Mt. Vernon, N. Y.
 Bentley, J. C. . . . Elizabeth, N. J.
 Berger, Bernt. . . . New York City
 Berger, John. . . . New York City
 Berry, J. B. . . . Oak Park, Ill.
 Bettes, C. R. . . . Far Rockaway, N. Y.
 Betts, F. K. . . . Kingston, N. Y.
 Betts, R. T. . . . New York City
 Beugler, E. J. . . . New York City
 Bevan, L. J. . . . New York City
 Bilyeu, C. S. . . . New York City
 Bingham, C. A. . . . Elizabeth, N. J.
 Black, E. F. . . . New York City
 Blackmore, G. G. . . . New York City
 Blair, Alexander. . . . Summit, N. J.
 Blair, C. M. . . . New Haven, Conn.
 Blakeslee, C. . . . New Haven, Conn.
 Blakeslee, H. L. . . . New Haven, Conn.
 Blanchard, A. H. . . . New York City
 Blossom, Francis. . . . New York City
 Boardman, C. S. . . . Buffalo, N. Y.
 Boardman, W. H. . . . Newark, N. J.
 Boes, F. C.,
 West New Brighton, N. Y.
 Bogart, John. . . . New York City
 Bogert, C. L. . . . New York City
 Boller, A. P., Jr.,
 East Orange, N. J.
 Boniface, A. . . . Scarsdale, N. Y.
 Booth, G. W. . . . New York City
 Booz, H. C. . . . Philadelphia, Pa.
 Boucher, W. J. . . . New York City
 Boughton, W. H.,
 Poughkeepsie, N. Y.
 Bowditch, J. H.,
 New Brighton, N. Y.
 Bowman, A. L. . . . New York City
 Bowman, D. W. . . . Phoenixville, Pa.
 Boyd, J. C. . . . Montclair, N. J.
 Boyd, R. W. . . . New York City
 Brace, J. H. . . . Cedars, Que., Canada
 Brackenridge, J. C.,
 Richmond Hill, N. Y.
 Brackett, Dexter. . . Boston, Mass.
 Bradbury, R. R.,
 Pleasantville, N. Y.
 Bradley, F. E. . . . New York City
 Brainerd, H. A. . . . Westfield, N. J.
 Bramwell, G. W. . . . New York City
 Branne, J. S. . . . Mt. Vernon, N. Y.
 Braunworth, P. L. . . . Roseland, N. J.
 Breithaupt, W. H.,
 Berlin, Ont., Canada
 Breitzke, C. F. . . . Boonton, N. J.
 Brennan, J. L. . . . New York City
 Breuchaud, Jules. . . New York City
 Briggs, W. C. . . . Brooklyn, N. Y.

- Brink, L. C.....New York City
 Brodie, O. L.,
 West New Brighton, N. Y.
 Brooks, D. W....New York City
 Brooks, J. P.....Potsdam, N. Y.
 Brown, A. T..White Plains, N. Y.
 Brown, C. E.,
 Hudson Heights, N. J.
 Brown, D. H.....Newark, N. J.
 Brown, E. H....Hempstead, N. Y.
 Brown, G. C.....Ithaca, N. Y.
 Brown, L. L.....New York City
 Brown, S. P.,
 Montreal, Que., Canada
 Bruce, J. M.....New York City
 Brumley, D. J.....Chicago, Ill.
 Brunner, John.....Chicago, Ill.
 Brush, W. W.....New York City
 Bryan, C. W.....New York City
 Buck, H. R.....Hartford, Conn.
 Buel, A. W.....New York City
 Buel, E. D.....New York City
 Buettner, O. G. H..New York City
 Burden, James....Oswego, N. Y.
 Burdett, F. A.....New York City
 Burgess, G. H.....Albany, N. Y.
 Burnham, F. W....New York City
 Burpee, G. W.....New York City
 Burr, W. H.....New York City
 Burroughs, H. R..New York City
 Burrowes, H. G..Mt. Vernon, N. Y.
 Burrowes, R. W.,
 Long Beach, N. Y.
 Bush, E. W.....Lyme, Conn.
 Bush, H. D.....Baltimore, Md.
 Bush, Lincoln..East Orange, N. J.
 Bushnell, H. E...Bloomfield, N. J.
 Cahn, Elias.....New York City
 Campbell, C. C..Philadelphia, Pa.
 Cantwell, H. H....Yonkers, N. Y.
 Carey, E. G..White Plains, N. Y.
 Carle, N. A.....Newark, N. J.
 Carmalt, L. J....Hartford, Conn.
 Carpenter, A. W..Yonkers, N. Y.
 Carr, Albert..East Orange, N. J.
 Carter, E. C.....Chicago, Ill.
 Carter, F. H....Cambridge, Mass.
 Casani, A. A.....New York City
 Casler, M. D..Mt. Vernon, N. Y.
 Chase, C. F..New Britain, Conn.
 Cheney, H. N...Dorchester, Mass.
 Chester, J. N....Pittsburgh, Pa.
 Chevalier, L....Jersey City, N. J.
 Choate, J. K.....New York City
 Christian, G. L....New York City
 Christie, W. W....Paterson, N. J.
 Christy, G. L....New York City
 Churchill, C. S....Roanoke, Va.
 Claffin, W. B.,
 West Redding, Conn.
 Clapp, S. K.....Ashokan, N. Y.
 Clark, A. E.....New York City
 Clark, E. W..Pleasantville, N. Y.
 Clark, G. H.....New York City
 Clarke, G. C.....New York City
 Clarke, St. J.....Bogota, N. J.
 Cleveland, L. B..Watertown, N. Y.
 Codwise, H. R....Brooklyn, N. Y.
 Coe, Robert.....Pittsburgh, Pa.
 Cogswell, W. B...Syracuse, N. Y.
 Cohen, A. B.....Hoboken, N. J.
 Cohen, F. W.,
 Upper Montclair, N. J.
 Cole, E. S.....New York City
 Cole, G. N.....New York City
 Coleman, J. F..New Orleans, La.
 Coltman, R., Jr..Elmhurst, N. Y.
 Comber, S. X....New York City
 Conard, W. R..Burlington, N. J.
 Condron, T. L.....Chicago, Ill.
 Conger, A. A.,
 Shelburne Falls, Mass.
 Connell, H. L....New York City
 Connell, W. H..Philadelphia, Pa.
 Connelly, J. A. A..New York City
 Cook, F. S.....Yonkers, N. Y.
 Cook, J. H.....Passaic, N. J.
 Coombs, A. W....New York City
 Coombs, R. D....New York City

Cooper, D. R.	New York City	Deyo, S. L. F.	New York City
Cornell, J. N. H.	New York City	Dibert, H. M.	Troy, N. Y.
Corthell, A. B.	Winchester, Mass.	Diebitsch, E.	Nutley, N. J.
Crane, A. S.	New York City	Diehl, G. C.	Buffalo, N. Y.
Crane, J. S.	Newark, N. J.	Dilks, L. C.	New York City
Craven, Alfred.	Yonkers, N. Y.	Dixon, G. G.	Kent, Ohio
Creager, W. P.	Ridgewood, N. J.	Dodge, S. D.	Cornwall, N. Y.
Crehore, W. W.	New York City	Donham, B. C.	Glen Ridge, N. J.
Cresson, B. F., Jr.	New York City	Donle, E. R.	New York City
Crooks, C. H.	New York City	Doron, C. S.	Brooklyn, N. Y.
Crosby, W. W.	Baltimore, Md.	Dorrance, W. T.	Boston, Mass.
Crowell, Foster.	New York City	Douglas, W. J.	New York City
Cuddeback, A. W.	Paterson, N. J.	Douty, D. E.	New York City
Culyer, T. C.		Downman, J. R.,	
	Purdy Station, N. Y.		Washington, D. C.
Cummin, Hart.	New York City	Doyen, G. E.	New York City
Cummings, Noah.	New York City	Dufour, F. O.	Athens, Pa.
Cummings, R. A.	Pittsburgh, Pa.	Durfee, J. J.	New York City
Cuntz, W. C.	New York City	Durham, H. W.	New York City
Currier, C. G.	New York City	Durham, L.	New Paltz, N. Y.
Curtis, C. E.	Johnstown, Pa.	Dykeman, C. F.	Brooklyn, N. Y.
Curtis, F. S.	Boston, Mass.		
Curtis, V. P.	Worcester, Mass.	Earle, Thomas.	Steelton, Pa.
Cushing, W. C.	Pittsburgh, Pa.	Easby, M. W.	Philadelphia, Pa.
Cutting, G. W., Jr.	Boston, Mass.	Easterbrook, F. J.,	
			New Haven, Conn.
Dahl, S. T.	New York City	Eckersley, J. O.	New York City
Dailey, J. A.	East Orange, N. J.	Eddy, H. P.	Boston, Mass.
Dakin, A. H., Jr.	New York City	Edmondson, R. S.	New York City
Dana, R. T.	New York City	Edwards, D. G.	Brooklyn, N. Y.
Darling, J. H.	Duluth, Minn.	Edwards, J. H.	Passaic, N. J.
Darrach, C. G.	Philadelphia, Pa.	Edwards, W. R.	Baltimore, Md.
Davies, J. V.	New York City	Ehle, Boyd, Victoria, B. C.,	Canada
Davis, A. P.	Washington, D. C.	Ehrbar, L. H.	New York City
Davis, B. H.	New York City	Eide, Torris.	New York City
Davis, C. E.	Philadelphia, Pa.	Elliott, C. G.	Washington, D. C.
Davis, J. L.	Mt. Vernon, N. Y.	Elliott, J. W.	Burlington, Vt.
Day, E. B.	New York City	Ellis, G. W.	Hornell, N. Y.
Dean, A. W.	Boston, Mass.	Ellis, H. C.	White Plains, N. Y.
Deans, J. S.	Phoenixville, Pa.	Ellis, J. W.	Woonsocket, R. I.
DeGraff, H. W.	Amsterdam, N. Y.	Ely, C. B.	Harrisburg, Pa.
Deiser, N. A.	Brooklyn, N. Y.	Emerson, K. B.	New York City
Develin, R. G.	Philadelphia, Pa.	Endemann, H. K.,	
Devin, George.	Kansas City, Mo.		Long Island City, N. Y.
DeWitt, P. H.	Phillipsburg, N. J.	Endicott, M. T.	Washington, D. C.

- Entenmann, P. M. . . . Brooklyn, N. Y.
 Ewing, W. W. . . . Westfield, N. J.
- Farley, J. M. . . . White Plains, N. Y.
 Farley, M. M. New York City
 Farnham, A. B. . . . Pittsfield, Mass.
 Farnham, R., Jr. . . Philadelphia, Pa.
 Farrington, H. P. . . New York City
 Federlein, W. G. . . New York City
 Ferguson, L. R. . . Philadelphia, Pa.
 Fernstrom, H. Norfolk, Va.
 Ferry, C. A. . . . New Haven, Conn.
 Fetherston, J. T. . . New York City
 Files, T. H. New York City
 Firth, E. W. Jamaica, N. Y.
 Fisher, E. A. Rochester, N. Y.
 FitzGerald, D. . . . Brookline, Mass.
 Flinn, A. D. Yonkers, N. Y.
 Floy, Henry. New York City
 Flynn, G. A. New York City
 Forbes, F. B. New York City
 Ford, H. C. New York City
 Forrest, C. N. Maurer, N. J.
 Fortin, S. J.,
 Montreal, Que., Canada
 Foss, F. E. New York City
 Fougner, H. New York City
 Francis, W. J.,
 Montreal, Que., Canada
 Franklin, C. M. . . . New York City
 Frazee, J. H. New York City
 French, A. H. . . . Brookline, Mass.
 French, A. W. . . . Worcester, Mass.
 French, C. R. . . . Wilkes-Barre, Pa.
 French, Halsey. . . Brooklyn, N. Y.
 French, J. B. New York City
 Frost, G. S. Brooklyn, N. Y.
 Fuller, G. W. New York City
 Fuller, W. B. New York City
 Fuller, W. E. New York City
 Furber, W. C. . . . Philadelphia, Pa.
- Gahagan, W. H. . . . Brooklyn, N. Y.
 Gandolfo, J. H. . . . New York City
 Gardiner, F. W. . . . Yonkers, N. Y.
- Gardner, Warren. . . New York City
 Garfield, C. A. . . . White Plains, N. Y.
 Gartensteig, C. . . . New York City
 George, W. W.,
 East Liverpool, Ohio
 Gerber, Emil. Pittsburgh, Pa.
 Gerhard, N. P. . . . Scarsdale, N. Y.
 Gibboney, F. L. Roanoke, Va.
 Gibbs, E. A. Pittsburgh, Pa.
 Giesey, J. K. New York City
 Gifford, G. E. New York City
 Gildersleeve, A. C. . . New York City
 Giles, Robert. New York City
 Gillespie, R. H. . . . New York City
 Gilman, Charles. . . Plainfield, N. J.
 Gladding H. H. . . . New Haven, Conn.
 Goldsborough, J. B. . . Croton, N. Y.
 Goldsmith, W. New York City
 Goodell, J. M.,
 Upper Montclair, N. J.
 Goodman, Joseph. . . New York City
 Goodman, Louis. . . . New York City
 Goodrich, E. P. . . . Brooklyn, N. Y.
 Goodsell, D. B. . . . New York City
 Goodwin, R. E. . . . New York City
 Gould, C. M. Cold Spring, N. Y.
 Gould, W. T. Hastings, N. Y.
 Gowen, J. F. Ossining, N. Y.
 Graham, G. A. . . . New York City
 Granbery, J. H. . . . New York City
 Grantham, H. T. . . . Philadelphia, Pa.
 Gravell, W. H. . . . Philadelphia, Pa.
 Gray, William. New York City
 Greathead, J. E. . . . New York City
 Green, C. N. New York City
 Greene, C. New York City
 Greene, G. S., Jr. . . New York City
 Greenlaw, R. W. . . . New York City
 Gregg, J. H. C. . . . Brooklyn, N. Y.
 Gregory, C. E. Mt. Kisco, N. Y.
 Greiner, J. E. Baltimore, Md.
 Griffith, W. F. R. . . . Norfolk, Va.
 Gudmundsson, G. . . . Pittsburgh, Pa.
 Guise, Philip. Brooklyn, N. Y.
 Guthrie, K. O. . . . Schenectady, N. Y.

- Guttridge, J. A.,
 Brown Station, N. Y.
 Haas, P. L. New York City
 Haines, E. G. Brooklyn, N. Y.
 Hale, H. M. Brooklyn, N. Y.
 Hall, M. W. New York City
 Hall, W. M. Parkersburg, W. Va.
 Hallihan, J. P. New York City
 Hallock, J. C. Newark, N. J.
 Halsey, W. H.,
 Bridgehampton, N. Y.
 Hamilton, E. P. New York City
 Hamilton, J. W. New York City
 Hammond, G. T. Brooklyn, N. Y.
 Hammond, J. F.,
 Richmond Hill, N. Y.
 Hammond, J. M. Kansas City, Mo.
 Hanavan, W. L. New York City
 Hansel, Charles. Cranford, N. J.
 Harding, H. S. New York City
 Haring, Alex. New York City
 Harps, H. M. Brooklyn, N. Y.
 Harrington, J. L.,
 Kansas City, Mo.
 Harris, F. R. Brooklyn, N. Y.
 Harris, Stephen. Philadelphia, Pa.
 Harrison, L. B. New York City
 Harte, C. R. New Haven, Conn.
 Hartman, A. F. Nutley, N. J.
 Harwi, S. J. Bayonne, N. J.
 Haskell, E. E. Ithaca, N. Y.
 Haskins, W. J. New York City
 Hatt, W. K. Lafayette, Ind.
 Hatton, H. W. Wilmington, Del.
 Hatton, T. C. Wilmington, Del.
 Hauck, William. New York City
 Hazard, E. Wilkinsburg, Pa.
 Hazelton, C. W.,
 Montague City, Mass.
 Hazen, Allen. New York City
 Hazen, W. N. East Orange, N. J.
 Heald, E. C. Washington, D. C.
 Healy, J. R. New York City
 Hedges, S. H. Seattle, Wash.
 Heilbronner, L. C. Utica, N. Y.
 Heiser, A. B. Brooklyn, N. Y.
 Heller, J. W. Newark, N. J.
 Henderson, J. T. Hartford, Conn.
 Henry, P. W. New York City
 Hering, Rudolph. Montclair, N. J.
 Hermanns, F. E. New York City
 Hewes, V. H. New York City
 Higgins, C. H. Jersey City, N. J.
 Higgins, J. W. Roselle Park, N. J.
 Higginson, J. Y. New York City
 Hill, W. R. Albany, N. Y.
 Hilton, J. C. Brooklyn, N. Y.
 Hilts, H. E. Philadelphia, Pa.
 Himes, A. J. Cleveland, Ohio
 Hocke, J. G. Bayonne, N. J.
 Hodgdon, B. A. New York City
 Hodgdon, F. W. Boston, Mass.
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 Preston, H. W. . . . Elmira, N. Y.
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 Rice, G. S. New York City
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 Richardson, T. F. . . Brooklyn, N. Y.
 Richmond, J. P. W., Yonkers, N. Y.
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 Rights, L. D. New York City
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 Roberts, R. F. . . . Nutley, N. J.
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 Robinson, G. L. . . . New York City
 Robinson, R. T. . . Mt. Vernon, N. Y.
 Rockwood, N. C. . . Brooklyn, N. Y.
 Rogers, A. W. . . . Rochester, N. Y.
 Rogers, E. H. . . . West Newton, Mass.
 Rogers, H. L. . . . New York City
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 Rossi, Irving. . . . New York City
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 Rumery, R. R. . . . New York City

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- Ryder, E. M. T. . . . Yonkers, N. Y.
- Ryon, Henry. Brooklyn, N. Y.
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Tufts College, Mass.
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 Wickham, H. R. Rochester, N. Y.
 Wiggin, E. W. New Haven, Conn.
 Wiggin, T. H. Scarsdale, N. Y.
 Wiggins, W. D. Pittsburgh, Pa.
 Wilcock, F. Brooklyn, N. Y.
 Wild, H. J. Chester, Pa.
 Wilder, C. W. Brooklyn, N. Y.
 Wildes, W. G. Rochester, N. Y.
 Wiley, W. H. New York City
 Wilgus, W. J. New York City
 Wilkins, W. G. Pittsburgh, Pa.
 Williams, E. G. Brooklyn, N. Y.
 Williams, F. M. Goshen, N. Y.

Williams, G. S. Ann Arbor, Mich.	Wolfe, F. G. Scranton, Pa.
Wilmot, James. New York City	Wölfel, P. L. Pittsburgh, Pa.
Wilmot, Sydney. New York City	Wood, G. P. Peekskill, N. Y.
Wilson, C. W. S.,	Worthington, C. New York City
New Rochelle, N. Y.	Wright, F. J. Paterson, N. J.
Wilson, James. Montchanin, Del.	Wright, J. B. New York City
Wilson, P. H. Philadelphia, Pa.	Wyckoff, C. R. Hartsdale, N. Y.
Wilson, T. L. New York City	Wyman, A. M. East Orange, N. J.
Wilson, W. T. New York City	
Wilson, W. W. Berwyn, Pa.	Yates, P. K. New York City
Wilson, William. New York City	Yates, W. H. Albany, N. Y.
Winsor, F. E. White Plains, N. Y.	Yereance, W. B. New York City
Winsor, G. A. Valhalla, N. Y.	
Winsor, H. D. New York City	Zipser, M. E.,
Witmer, F. P. East Orange, N. J.	Cornwall-on-Hudson, N. Y.
Wolfe, F. C. Baltimore, Md.	Zook, M. A. Plainfield, N. J.

ANNUAL CONVENTION

ANNOUNCEMENTS

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

FUTURE MEETINGS

March 4th, 1914.—8.30 P. M.—A regular business meeting will be held, and a paper by John C. Koch, Assoc. M. Am. Soc. C. E., entitled, "An Investigation of Sand-Clay Mixtures for Road Surfacing", will be presented for discussion.

This paper is printed in this number of *Proceedings*.

March 11th, 1914.—A Special Meeting will be held at the Society House on Wednesday, March 11th, 1914, at 8.30 P. M., for the discussion of the subject of the Valuation of Public Utilities.

The Report of the Special Committee on Valuation for the Purpose of Rate-Making, which was formally presented to the Annual Meeting, will be the special subject for discussion. So much interest has been developed that it is believed an opportunity for debate on the questions involved will be taken advantage of by many. Written discussions on this subject will be received and printed in *Proceedings* as soon after their receipt as possible.

March 18th, 1914.—8.30 P. M.—At this meeting a paper by C. G. Wrentmore, M. Am. Soc. C. E., and Messrs. Hugh Brodie and C. O. Carey, entitled, "Report on a Series of Tests on Concrete Columns Reinforced with a Spiral of Steel", will be presented for discussion.

This paper is printed in this number of *Proceedings*.

ANNUAL CONVENTION

The Forty-sixth Annual Convention of the Society will be held at Baltimore, Md., from June 2d to 5th, 1914, inclusive.

The following Committees to take charge of arrangements have been appointed:

Committee of the Board of Direction:

JAMES H. EDWARDS, GEORGE W. FULLER,
CHAS. WARREN HUNT.

Local Committee of Arrangements:

FRANCIS LEE STUART, *Chairman*.

MENDES COHEN,	W. ANDERSON POLK,
W. W. CROSBY,	LAYTON F. SMITH,
J. E. GREINER,	H. A. WARREN,
F. H. HAMBLETON,	E. B. WHITMAN.

SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members who have made use of the resources of the Society in this manner, has been expressed frequently, and leaves little doubt that if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In reference to this work, the Appendices* to the Annual Reports of the Board of Direction for the years ending December 31st, 1906, and December 31st, 1910, contain summaries of all searches made to date.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings*.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in *Proceedings*, and set down for presentation to a future meeting of the Society, and on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions, only, will be re-

* *Proceedings*, Vol. XXXIII, p. 20 (January, 1907); Vol. XXXVII, p. 28 (January, 1911).

quested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

The Board of Direction has adopted rules for the preparation and presentation of papers, which will be found on page 429 of the August, 1913, *Proceedings*.

LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 p. m., at the Palace Hotel, on the third Friday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 p. m. every Wednesday, and the place of meeting may be ascertained by communicating with the Secretary of the Association, E. T. Thurston, Jr., M. Am. Soc. C. E., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers are held on the second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary, Roger W. Toll, Assoc. M. Am. Soc. C. E., 700 Tramway Building, Denver, Colo. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Visiting members are urged to attend the meetings.

(Abstract of Minutes of Meeting)

January 9th, 1914.—The meeting was called to order; President Ridgway in the chair; Roger W. Toll, Secretary; and present, also, 22 members and guests.

The minutes of the meeting of November 14th, 1913, were read and approved. The meeting scheduled for December 19th, 1913, was not held on account of weather conditions.

The President stated that the weekly luncheons would be discontinued until further notice, on account of the reorganization of the Colorado Traffic Club.

The adoption of an emblem by the Association was discussed, and the Secretary was ordered to report on the matter at the next meeting.

The Report of the Special Committee on Valuation of Public Utilities of the Society was discussed by Messrs. Leonard Metcalf, A. L. Fellows, E. C. van Diest, H. H. Logan, President Ridgway, and others.

Adjourned.

Atlanta Association

On March 14th, 1912, the Atlanta Association of Members of the American Society of Civil Engineers was organized, with the following officers: Arthur Pew, President; William A. Hansell, Jr., Secretary; and Messrs. James N. Hazlehurst and B. M. Hall, Members of the Executive Committee. The Association will hold its meetings in the house of the University Club.

Philadelphia Association

On December 22d, 1913, the Philadelphia Association of Members of the American Society of Civil Engineers was organized, with the following officers: George S. Webster, President; Richard L. Humphrey and F. Herbert Snow, Vice-Presidents; J. W. Ledoux, Edgar Marburg, and H. S. Smith, Directors; S. M. Swaab, Treasurer; and W. L. Stevenson, Secretary. The meetings of the Association will be held at the Engineers' Club of Philadelphia, 1317 Spruce Street.

Portland, Ore., Association

On June 18th, 1913, the Portland, Ore., Association of Members of the American Society of Civil Engineers was organized with the following officers: E. G. Hopson, President; W. S. Turner, First Vice-President; D. D. Clarke, Second Vice-President; G. B. Hegardt, Treasurer; and Charles J. McGonigle, Secretary.

(Abstract of Minutes of Meeting)

January 27th, 1914.—The meeting was called to order; Vice-President Turner in the chair; Charles J. McGonigle, Secretary; and present, also, 20 members and 2 guests.

The minutes of the preceding meeting were read and approved.

A communication from Charles Warren Hunt, M. Am. Soc. C. E., Secretary of the American Society of Civil Engineers, was read.

The Secretary was instructed to ascertain the sentiment among the membership as to an amendment to the Constitution looking to changing the name of the Association to the "Portland, Oregon, Association of Members of the American Society of Civil Engineers," which change was suggested by Mr. Hunt, the Secretary of the Society.

On motion, the Secretary was instructed to obtain prices for printing the Constitution and By-Laws of the Association in pamphlet form.

A paper by Frederick C. Schubert, M. Am. Soc. C. E., on the "Dalles-Celilo Canal", was presented by the author, and the subject was generally discussed by those present.

Adjourned.

Seattle Association

At the Annual Meeting of the Association, held on January 26th, 1914, the following officers were elected for the ensuing year: Ernest B. Hussey, President; A. H. Fuller, Vice-President; and Carl H. Reeves, Secretary-Treasurer.

Southern California Association

On January 5th, 1914, the Southern California Association of Members of the American Society of Civil Engineers held its first meeting at the University Club, Los Angeles, Cal., and elected the fol-

lowing officers: J. B. Lippincott, President; Charles T. Leeds, First Vice-President; George S. Binckley, Second Vice-President; W. K. Barnard, Secretary; and Charles H. Lee, Treasurer.

About 60 members of the Society were present, and many others have signified their interest in the formation of the Local Association.

A paper on the "Thomas System of Reinforcing and Three-Hinged Arch Bridges", was read by W. M. Thomas, Assoc. M. Am. Soc. C. E., who illustrated his remarks with lantern slides, and certain features of the work were discussed by those present.

Texas Association

At its meeting of December 31st, 1913, the Board of Direction considered and approved the proposed Constitution of the Texas Association of Members of the American Society of Civil Engineers.

PRIVILEGES OF ENGINEERING SOCIETIES EXTENDED TO MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms, and at all meetings:

American Institute of Mining Engineers, 29 West Thirty-ninth Street, New York City.

American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York City.

Architekten-Verein zu Berlin, Wilhelmstrasse 92, Berlin W. 66, Germany.

Associação dos Engenheiros Cívis Portuguezes, Lisbon, Portugal.

Australasian Institute of Mining Engineers, Melbourne, Victoria, Australia.

Boston Society of Civil Engineers, 715 Tremont Temple, Boston, Mass.

Brooklyn Engineers' Club, 117 Remsen Street, Brooklyn, N. Y.

Canadian Society of Civil Engineers, 413 Dorchester Street, West, Montreal, Que., Canada.

Civil Engineers' Society of St. Paul, St. Paul, Minn.

Cleveland Engineering Society, Chamber of Commerce Building, Cleveland, Ohio.

Cleveland Institute of Engineers, Middlesbrough, England.

Dansk Ingeniørforening, Amaliegade 38, Copenhagen, Denmark.

Engineers and Architects Club of Louisville, 1412 Starks Building, Louisville, Ky.

Engineers' Club of Baltimore, Baltimore, Md.

Engineers' Club of Minneapolis, 17 South Sixth Street, Minneapolis, Minn.

Engineers' Club of Philadelphia, 1317 Spruce Street, Philadelphia, Pa.

- Engineers' Club of St. Louis**, 3817 Olive Street, St. Louis, Mo.
Engineers' Club of Toronto, 96 King Street, West, Toronto, Ont., Canada.
Engineers' Society of Northeastern Pennsylvania, 415 Washington Avenue, Scranton, Pa.
Engineers' Society of Pennsylvania, 219 Market Street, Harrisburg, Pa.
Engineers' Society of Western Pennsylvania, 2511 Oliver Building, Pittsburgh, Pa.
Institute of Marine Engineers, 58 Romford Road, Stratford, London, E., England.
Institution of Engineers of the River Plate, Calle 25 de Mayo 195, Buenos Aires, Argentine Republic.
Institution of Naval Architects, 5 Adelphi Terrace, London, W. C., England.
Junior Institution of Engineers, 39 Victoria Street, Westminster, S. W., London, England.
Koninklijk Instituut van Ingenieurs, The Hague, The Netherlands.
Louisiana Engineering Society, Room 6, City Bank and Trust Company Building, New Orleans, La.
Memphis Engineering Society, Memphis, Tenn.
Midland Institute of Mining, Civil and Mechanical Engineers, Sheffield, England.
Montana Society of Engineers, Butte, Mont.
North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne, England.
Oesterreichischer Ingenieur- und Architekten-Verein, Eschenbachgasse 9, Vienna, Austria.
Pacific Northwest Society of Engineers, 803 Central Building, Seattle, Wash.
Rochester Engineering Society, Rochester, N. Y.
Sachsischer Ingenieur- und Architekten-Verein, Dresden, Germany.
Sociedad Colombiana de Ingenieros, Bogota, Colombia.
Sociedad de Ingenieros del Peru, Lima, Peru.
Societe des Ingenieurs Civils de France, 19 Rue Blanche, Paris, France.
Society of Engineers, 17 Victoria Street, Westminster, S. W., London, England.
Svenska Teknologforeningen, Brunkebergstorg 18, Stockholm, Sweden.
Tekniske Forening, Vestre Boulevard 18-1, Copenhagen, Denmark.
Western Society of Engineers, 1737 Monadnock Block, Chicago, Ill.

ACCESSIONS TO THE LIBRARY

(From January 6th to February 2d, 1914)

DONATIONS*

TECHNIQUE OF MODERN TACTICS:

A Study of Troop Leading Methods in the Operations of Detachments of all Arms. By P. S. Bond, M. Am. Soc. C. E., and M. J. McDonough, Assoc. M. Am. Soc. C. E. Cloth, $9\frac{1}{2}$ x $6\frac{1}{2}$ in., illus., 344 pp. Menasha, Wis., George Banta Publishing Company, 1913. (Donated by the Authors.)

The purpose of this volume, it is stated, is to supply in compact form the help needed by instructors, or students, of problems of military tactics, in the applicatory method of study, not only as a textbook, but also as a guide in the preparation or solution of such problems. The organizations used by the authors, are said to be those of the American Service, but the tactical principles discussed are of general application and pertain to systematic organized warfare against a civilized foe. In their discussion of various methods and formations, the authors, it is stated, have endeavored to describe clearly all the principles which may be applicable and, at the same time, to give concrete illustrations in figures, distances, etc., of simple cases. The book is intended as a ready reference for the officer in charge of garrison schools, militia instruction, field manoeuvres, war games, etc., as an instructor, critic, and guide for the officer of the army or militia compelled to study alone, and as a guide to officers preparing for promotion examination, at the Service Schools, etc. There is a short bibliography which it is said may be found useful for study and reference in connection with the subject. The Contents are: Organization of the U. S. Army; The Preparation and Solution of Practical Problems; Field Orders; Patrolling; Advance Guards; Rear Guards, Flank Guards; Marches, Change of Direction of March, Camps and Bivouacs; Convoys; Artillery Tactics; Cavalry Tactics; Outposts, Combat, Attack and Defense; Organization of a Defensive Position; Combat; A Position in Readiness; Sanitary Tactics; The Rifle in War; Notes on Division Tactics and Supply.

THE HOLLOW-TILE HOUSE.

By Frederick Squires. Cloth, $10\frac{1}{2}$ x $7\frac{1}{2}$ in., illus., 208 pp. New York, The William T. Comstock Co., 1913. \$2.50.

In this book, as stated on the title-page, the reader is introduced to hollow-tile in the making, is told how it is wrought into houses and is shown, by numerous illustrations, how these houses look and from what foreign sources their appearance is an heritage. The Chapter headings are: Tile-Making; Old Work Stucco; About Construction; Counting the Cost; The History of the Use of Hollow Tile for Houses; Architects' Tile Houses; Building the Other Man's House; Floor Building; Tile in Stucco Surfaces; Tricks of the Trade; Tile and Concrete, Partners; Texture and Scale; The Flat-Roofed House; An Interesting Experiment; The House of Three Inventions.

FOWLER'S MECHANICAL ENGINEER'S POCKET BOOK, 1914.

Edited by William H. Fowler. Sixteenth Annual Edition. Leather, $6\frac{1}{2}$ x 4 in., illus., 66 + 576 pp. Manchester, England, Scientific Publishing Co., 1914. 2 shillings 9 pence.

This Pocket Book contains more than 600 pages of information useful to the mechanical engineer, including miscellaneous Tables and Formulas, matter relating to Steam Boilers and Fittings, Fuels and Combustion, Steam Engines, Steam Turbines, Steam Tables, Valves and Valve Gear, Internal Combustion Engines, Hydraulics, Pumps and Pumping Arrangements, Gearing and Lubrication, Hoisting and Lifting Machinery, Iron and Steel, Metals and Alloys, Beams and Pillars, Springs, Chemistry, and Ventilation and Heating. The Index covers 28 pages.

PROGRESS AND PROSPERITY:

The Old World and Its Remaking Into the New—The Story of the Mediums of Development—The Building of Empires in America, The World's Wonderland. By William de Hertburne Washington, Assoc.

*Unless otherwise specified, books in this list have been donated by the publishers.

M. Am. Soc. C. E. Three-quarters Morocco, $9\frac{1}{2} \times 6\frac{1}{4}$ in., illus., 32 + 887 pp. New York, The National Educational Publishing Co., 1911. \$4.50. (Donated by the Author.)

The author's aim in this book, it is stated, has been to tell the story of man's material civilization by portraying the evolution of transportation and its wonderful effect on the progress and prosperity of the world. He describes in detail the organization, operation, and influence of land and water transportation systems, both in the United States and abroad, the accompanying conditions of civilization, and their direct economic effects on present-day problems, in simple and non-technical language, illustrating his text with many and rare drawings. The Contents are: Foreword; The Essential Forces Making for Progress and Prosperity; The Magnitude of the Railroad; The Making of Nations; The Greatest Revolution of the World; Artificial Waterways; The Beginning of the Real New World; The Real Winners of the West; The Birth of a Railroad; Banks, Banking and Money; The Origin and Analysis of the Corporation; Capitalization and Overcapitalization; Cost of Construction of Steam Roads; The Analysis of the Cost of a Railroad; Analysis of the Profits; The Rich and the Poor Roads; Who are in the Business? Spending for Labor; Human Machinery; How the Railroad Business is Built Up and Maintained; Trusts and Trust Busting; Transportation a Developer and Creator of Land Values; Contrasts for Thoughtful Consideration; The Great Steam Liveryman and Public Truckman; Good Roads, Bad Roads, and Rail Roads; The Postal, the Express, and the Baggage Service; The Ocean Railway; Contributions to Progress and Prosperity by Other Modes of Movement; Railway Rates; Facts About Accidents; The Railroads of the World; Government Ownership; The Unseen Expenses of the Steam Roads; Caring for the Iron Horse, the Evolution of Equipment; Elimination of Natural Obstacles to Progress and Prosperity; Some of the Auxiliary Machinery; A Story of Real Progress and Prosperity; The Making of Empires; The New World's Future; Electricity vs. Steam; The Golden Age; Our Own the First Age of Real Progress and Prosperity; An Appreciation of the Future; Looking Forward; The World's Work; Index to Illustrations.

QUESTIONS AND ANSWERS

Relating to Modern Automobile Design, Construction, Driving and Repairs: A Self-Instructor for Students, Mechanics and Motorists. By Victor W. Pagé. Cloth, $7\frac{1}{2} \times 5$ in., illus., 15 + 622 pp. New York, The Norman W. Henley Publishing Company, 1914. \$1.50.

In a secondary title, it is stated that this book is a practical treatise consisting of thirty-six lessons in the form of questions and answers, written with special reference to the requirements of the non-technical reader desiring easily understood explanatory matter relating to the construction, operation and repair of the automobile and including all the latest developments in automobile engineering. The text is fully illustrated with reproductions of actual engineering drawings and photographs of practical working parts. The subject is developed, it is said, in a logical manner, the reader being brought progressively from one element of the car to the next relative part, and the arrangement by lessons, it is hoped, will be found to be valuable as a textbook by those teaching automobile classes.

FOWLER'S MECHANICS' & MACHINISTS' POCKET BOOK & DIARY, 1914.

Edited by William H. Fowler. Sixth Annual Edition. Boards, 6 x 4 in., illus., 50 + 476 pp. Manchester, England, Scientific Publishing Co., 1914. 8 shillings.

The subject-matter contained in this volume, it is stated, includes a synopsis of practical rules for fitters, turners, millwrights, erectors, pattern makers, foundrymen, draftsmen, apprentices, students, etc., and contains exhaustive sections on Mensuration, Geometry and Trigonometry, Materials Used in Machine Construction, Machine Tool Design, Proportions of Machine Tool Parts, Metal-Cutting Tools, High-Speed Tool Steels, Drilling and Boring Metal, Screw Threads, Screw Cutting, and Taper Turning, Emery and Emery Wheels, Shop Practice, Wheel Gearing, Rope and Belt Driving, Shafting and Bearings, Lifting Ropes and Chains, together with numerous tables and an Index of 17 pages.

ROBERT FULTON, ENGINEER AND ARTIST:

His Life and Works. By H. W. Dickinson. Cloth, 9 x 6 in., illus., 14 + 333 pp. London, John Lane, The Bodley Head; New York, John Lane Company; Toronto, Bell & Cockburn, 1913.

In the preface the author states that his excuse for adding to the numerous biographies of Robert Fulton is that as far as he has observed none of the others

is altogether fair and impartial, his American biographers having credited him with greater achievements than facts warrant, and English writers have too often treated him as a charlatan, a flcher of other men's brains, and even as a traitor. The author states, therefore, that in this book he has endeavored by research and the collection of recently published material to preserve really important facts of Fulton's life and his inventions with sympathy and without bias. The Contents are: Ancestry, Birth, and Boyhood of Robert Fulton; Entry Into the World; Projects for Marine Propulsion; Correspondence with Lord Stanhope; Arrival in Paris; Second Attempt to Introduce the Submarine; Turns his Attention to Steam Navigation; Returns to England; Arrival in America; United States Patents; Construction of First Steam Man-of-War; Appendices; Index.

Gifts have also been received from the following:

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| Am. Concrete Inst. 1 pam. | Mississippi River Comm. 6 vol. |
| Am. Inst. of Elec. Engrs. 2 bound vol. | National Fire Protection Assoc. 4 pam. |
| Am. Ry. Master Mechanics' Assoc. 1 bound vol. | New South Wales-Dept. of Mines. 5 bound vol. |
| Am. Water Works Assoc. 1 pam. | New York City-Dept. of Parks. 2 bound vol. |
| Assam, India-Public Works Dept. 1 pam. | New York City-Dept. of Water Supply, Gas, and Electricity. 1 pam. |
| Bermondsey (London), England-Town Clerk. 1 bound vol. | New York City-Metropolitan Sewerage Comm. 2 pam. |
| Boston, Mass.-Dept. of Public Works. 1 bound vol. | New York State-Public Service Comm., First Dist. 1 bound vol. |
| Boston, Mass.-Transit Comm. 1 bound vol. | New York-State Comptroller. 1 pam. |
| Boston Soc. of Civ. Engrs. 1 pam. | New York-State Engr. and Surv. 1 bound vol. |
| British Columbia-Dept. of Lands. 1 pam. | New York-State Library. 5 bound vol. |
| Buckeye Engine Co. 1 pam. | New York City Record. 2 bound vol. |
| Buffalo, N. Y.-Bureau of Water. 1 pam. | New Zealand-Dept. of Mines. 12 vol. |
| Cambridge Univ. & Town Water-Works Co. 1 pam. | Norwich Univ. 7 pam. |
| Canada-Comm. of Conservation. 1 bound vol. | Pacific Tank & Pipe Co. 1 bound vol. |
| Canada-Dept. of Marine and Fisheries. 1 vol. | Panama R. R. Co. 1 pam. |
| Canada-Dept. of Mines. 1 vol., 1 pam. | Parker, Harold. 1 bound vol. |
| Canada-Dept. of Public Works. 1 vol. | Permanent Inter. Assoc. of Navigation Congresses. 2 pam. |
| Canada-Minister of Mines. 6 vol. | Philadelphia, Pa.-Bureau of Water. 1 vol. |
| Canadian Inst. 2 pam. | Philippine Islands-Bureau of Health. 1 vol. |
| Case School of Applied Science. 1 vol. | Philippine Islands-Bureau of Navigation. 1 pam. |
| Chicago, Ill.-Bureau of Public Efficiency. 1 pam. | Philippine Islands-Executive Bureau. 1 pam. |
| Columbia Univ.-Ernest Kempton Adams Fund. 1 vol. | Polytechnic Inst. of Brooklyn. 1 pam. |
| Columbus, Ohio-Water Dept. 2 pam. | Preston, England-Town Clerk. 1 bound vol. |
| Connecticut-State Board of Health. 1 bound vol. | Ramsgate, England-Town Clerk. 1 pam. |
| Darapsky, L. 1 pam. | Reale Istituto Lombardo di Scienze e Lettere. 2 vol. |
| Dartmouth Coll. 1 vol. | Rhode Island-State Board of Health. 1 bound vol. |
| Dist. of Columbia-Engr. Commr. 1 vol. | Richmond, Fredericksburg & Potomac R. R. Co. 1 pam. |
| Doolling, Peter J. 1 pam. | São Paulo, Brazil-República de Aguas e Esgotos. 2 vol. |
| East Indian Ry. Co. 1 pam. | Shanghai, China-Municipal Council. 4 vol. |
| Germany-Preussische Landesanstalt für Gewässerkunde. 1 pam. | Smith, J. Waldo. 1 bound vol. |
| Glazier, William L. 2 pam. | Smithsonian Institution. 2 pam. |
| Great Indian Peninsula Ry. Co. 1 pam. | Southern Pacific Co. 1 pam. |
| Harvard Univ. 1 bound vol., 1 vol. | Sunderland, England-Town Clerk. 2 pam. |
| Hawaii-Supt. of Public Works. 4 vol. | Switzerland-Landeshydrographie. 1 bound vol., 1 pam. |
| Horton, Robert E. 1 pam. | Sydney, New South Wales-Harbour Trust Commrs. 1 pam. |
| Hyde, C. G. 1 pam. | Tasmania-Commr. of Rys. 1 pam. |
| Illinois Univ.-Eng. Exper. Station. 2 bound vol. | Tasmania-Geol. Survey. 14 pam. |
| Institution of Civ. Engrs. 1 vol. | Tasmania-Secy. for Mines. 1 vol. |
| Institution of Naval Archts. 1 bound vol. | Tennessee-Min. Dept. 1 bound vol. |
| Johnson, Albert. 1 pam. | Transvaal-Rand Water Board. 2 pam. |
| Jones, R. M. 1 pam. | Union of South Africa-Mines Dept. 2 pam. |
| Lowestoft, England-Town Clerk. 2 pam. | U. S.-Bureau of Foreign and Domestic Commerce. 15 pam. |
| McCarty, R. J. 1 pam. | U. S.-Bureau of Insular Affairs. 1 pam. |
| Massachusetts-State Board of Health. 1 bound vol. | U. S.-Bureau of Lighthouses. 3 pam. |
| Master Car Builders' Assoc. 2 bound vol. | U. S.-Bureau of Mines. 6 pam. |
| Mellon Inst. of Industrial Research and School of Specific Industries. 1 pam. | |
| Michigan-Secy. of State. 1 bound vol. | |
| Minnesota Univ.-School of Mines Exper. Station. 1 bound vol. | |

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| U. S.-Bureau of Standards. 7 pam. | U. S.-Patent Office. 1 vol. |
| U. S.-Census Bureau. 7 bound vol., 2 pam. | U. S.-Secy. of the Interior. 2 pam. |
| U. S.-Chf. of Engrs. 3 bound vol. | U. S.-Weather Bureau. 2 bound vol. |
| U. S.-Coast and Geodetic Survey. 1 bound vol., 2 pam. | Victoria-State Rivers and Water Supply Comm. 7 pam. |
| U. S.-Dept. of Commerce. 1 pam. | Virginia-Bureau of Labor and Industrial Statistics. 1 bound vol. |
| U. S.-Forest Service. 4 pam. | Virginia-Geol. Survey. 1 pam. |
| U. S.-Geol. Survey. 5 vol., 13 pam. | Worcester Polytechnic Inst. 1 vol. |
| U. S.-Hygienic Laboratory. 3 pam. | Works, John D. 1 pam. |

BY PURCHASE

Engineering and Metallurgical Books, 1907-1911: A Full Title Catalogue, Arranged Under Subject Headings, of all British and American Books on Engineering, Metallurgy, and Allied Topics, Published during the Five Years 1907-1911, with Their English and American Prices and Publishers' Names. By R. A. Peddie. D. Van Nostrand Co., New York, 1912.

Railway Problems. Edited, with an Introduction, by William Z. Ripley. Revised Edition. Ginn and Company, Boston, New York, Chicago, London, 1913.

The American Woods, Illustrated by Actual Specimens with Full Text. By Romeyn B. Hough. Part XIII, Representing Twenty-five Species by Twenty-five Sets of Sections. The Author, Lowville, N. Y., 1913.

Der Wirkungsgrad von Dampfturbinen-Beschaufungen. Von Paul Wagner. Julius Springer, Berlin, 1913.

Schwimmkörper aus Eisenbeton. Von Walther Stross. Wilhelm Ernst & Sohn, Berlin, 1911.

Mitteilungen über Forschungsarbeiten auf dem Gebiete des Ingenieurwesens. Herausgegeben vom Verein deutscher Ingenieure. Hefte 143-144. Julius Springer, Berlin, 1913.

Lehrbuch des Maschinenbaues. Von Karl Esselborn. Zweiter Band: Dynamomaschinen und Elektromotoren; Hebemaschinen; Baummaschinen; Wasserkraftanlagen; Bearbeitungsmaschinen; bearbeitet von R. Bachmann, W. Kübler, W. Lindboe, A. Nachtweh, und H. Weihe. Wilhelm Engelmann, Leipzig und Berlin, 1913.

Jigs and Fixtures: A Reference Book Showing Many Types of Jigs and Fixtures in Actual Use, and Suggestions for Various Cases. By Fred H. Colvin and Lucian L. Haas. McGraw-Hill Book Company, Inc., New York and London, 1913.

Practical Uses of the Wave Meter in Wireless Telegraphy. By J. O. Mauborgne. McGraw-Hill Book Company, Inc., New York and London, 1913.

Principles of Industrial Organization. By Dexter S. Kimball. McGraw-Hill Book Company, Inc., New York and London, 1913.

Handbook for Machine Designers and Draftsmen. By Frederick A. Halsey. McGraw-Hill Book Company, Inc., New York and London, 1913.

Egyptian Irrigation. By Sir W. Willcocks and J. I. Craig, With an Introduction by Sir Hanbury Brown. Third Edition. 2 Vol. Spn & Chamberlain, New York; E. & F. N. Spon, Limited, London, 1913.

Neuere Bogenbrücken aus Umschnürtem Gusseisen. Von Fritz Edler von Emperger. Wilhelm Ernst & Sohn, Berlin, 1913.

Barker on Heating: The Theory and Practice of Heating and Ventilation. By A. H. Barker. The Carlton Press, London, 1912.

Poors' Manual of the Railroads of the United States, 1914. Poors' Railroad Manual Co., New York.

Handbuch der Ingenieurwissenschaften: Funfter Teil, Der Eisenbahnbau: Sechster Band, Betriebseinrichtungen Anhang die Kraftstellwerke; bearbeitet von M. Gadow. Von F. Loewe und H. Zimmermann. Wilhelm Engelmann, Leipzig und Berlin, 1913.

Forscharbeiten auf dem Gebiete des Eisenbetons: Der Einfluss der Längs und Querkkräfte auf Statisch Unbestimmte Bogen- und Rahmentragwerke. Von B. Rueb. Heft 22. Wilhelm Ernst & Sohn, Berlin, 1914.

SUMMARY OF ACCESSIONS

(From January 6th to February 2d, 1914)

Donations (including 14 duplicates).....	262
By purchase.....	19
Total.....	281

MEMBERSHIP

ADDITIONS

(From January 8th to February 5th, 1914)

MEMBERS		Date of Membership.
BOARDMAN, HAROLD SHERBURNE. Dean, Coll. of Technology, Univ. of Maine, Orono, Me.....	Assoc. M.	Feb. 3, 1904
	M.	Dec. 31, 1913
CODDINGTON, SAMUEL CECIL. Pres. and Engr., Coddington Eng. Co., 33d and Villard Ave., North Milwaukee, Wis.....		Dec. 31, 1913
ERICSON, ERIC GUSTAF. Prin. Asst. Engr., Northwest System, Penn. Lines W. of Pitts., Room 1121, Pennsylvania Station, Pittsburgh, Pa.....		Dec. 31, 1913
EVERETT, PERCIVAL HERBERT. Chf. Engr., Kern County Highway Comm., Room 109, Court House, Bakersfield, Cal.....		Dec. 31, 1913
GUDE, ALBERT VALDEMAR, JR. Engr. and Contr. (Gude & Co.), 712 Grant Bldg., Atlanta, Ga.....	Assoc. M.	June 5, 1907
	M.	Dec. 31, 1913
JAMES, EDGAR AUGUSTUS. (James, Loudon & Hertzberg), 26 Briar Hill Rd., Toronto, Ont., Canada.....		Dec. 3, 1913
MUKASA, SEITARO. Engr. in the President's Secretariat, Imperial Govt. Rys., 20 Fujimicho, Azabu, Tokyo, Japan.....		Dec. 3, 1913
PEASE, FLOYD ODELL. Care, Bolivia Development & Colonization Co., 9 rue Louis le Grand, Paris, France.....		Oct. 1, 1913
RANDORF, CHARLES ANDREW. Structural Engr., Lackawanna Steel Co., Buffalo, N. Y..	Assoc. M.	Dec. 6, 1910
	M.	Dec. 3, 1913
SMALL, CHARLES CHURCHILL. Box 888, Douglas, Ariz....		Dec. 31, 1913
SMITH, WILLIAM ERNEST. Care, City Engr.'s Office, St. Paul, Minn.....	Assoc. M.	Dec. 1, 1908
	M.	Oct. 1, 1913
SPIKER, WILLIAM CLARE. Cons. Engr., 1504 Hurt Bldg., Atlanta, Ga.....	Assoc. M.	June 5, 1907
	M.	Dec. 31, 1913
STANTON, FRED CASWELL. Asst. Engr., Isthmian Canal Comm., Cristobal, Canal Zone, Panama.....	Assoc. M.	April 1, 1908
	M.	Dec. 31, 1913
WOODBURY, WILLIAM HOOK. With C. P. Ry., Kamloops, B. C., Canada.....		Dec. 31, 1913

ASSOCIATE MEMBERS

ADAMS, MILTON JEWELL. Chf. Engr., Hawaii Loan Fund Comm., P. O. Box 497, Hilo, Hawaii.....	Dec. 31, 1913
BAKER, ALBERT READ. Engr., Marin Municipal Water Dist., San Rafael, Cal.....	Oct. 1, 1913

ASSOCIATE MEMBERS (*Continued*)

		Date of Membership.
RUMANN, CECIL SPENCER. Chf. Engr., Van Sant-Houghton Co., 503 Market St., Room 406, San Francisco, Cal..		Dec. 31, 1913
COOKE, CHESTER. Cons. Engr. (von Unwerth & Cooke), 609 East 9th St., Kansas City, Mo.....		Nov. 12, 1913
COOPER, GILBERT KENYON. Acting Chf. Engr., United Fruit Co., of Costa Rica, Port Limon, Costa Rica.....		Dec. 3, 1913
CRUM, ROY WINCHESTER. Asst. Prof., Experimental Eng., Iowa State Coll. of Agri. and Mechanic Arts, Ames, Iowa.....		Dec. 31, 1913
FRANCIS, HOWARD LEWIS. 6 ^a Balderas No. 79, City of Mexico, Mexico.....		Oct. 1, 1913
GIVAN, ALBERT. City Engr., City Hall, Sacramento, Cal..		Nov. 12, 1913
HARRINGTON, ARTHUR WILLIAM. Dist. Engr.'s Office, U. S. Geological Survey, Boise, Idaho.....	} Jun. Assoc. M.	Dec. 6, 1910
		Dec. 31, 1913
HART, RICHARD AMBROSE. Drainage Engr., U. S. Dept. of Agriculture, 319 Federal Bldg., Salt Lake City, Utah.....		Dec. 3, 1913
JORDAN, MYRON KENDALL. Draftsman, Kansas City Structural Steel Co., 1317 South 33d St., Kansas City, Kans.....	} Jun. Assoc. M.	Mar. 1, 1910
		Dec. 3, 1913
LAUER, MARTIN PHILIPPE. Archt. and Engr. (Lauer & Young), 19 I. O. O. F. Bldg., Akron, Ohio.....		Oct. 1, 1913
LETTON, HARRY PIKE. San. Engr., U. S. Public Health Service, 1437 Clifton St., N. W., Washington, D. C.....	} Jun. Assoc. M.	Feb. 1, 1910
		Dec. 3, 1913
LOOMIS, LESLIE BROWN. Asst. Chf. Engr., Transmission Tower Dept., Miliken Bros., Inc., Hillside Ave., Chatham, N. J.....		Dec. 31, 1913
LYON, FREDERIC WILLIAM. Div. Engr., Bureau of Water, 529 Oliver Bldg., Pittsburgh, Pa.....	} Jun. Assoc. M.	Oct. 3, 1911
		Dec. 31, 1913
MCCLURE, HARRY CLIFFORD. Chf. Engr., Dept. of Architecture, Board of Education, 119 Prescott St., Toledo, Ohio.....	} Jun. Assoc. M.	Mar. 1, 1910
		Sept. 3, 1913
MCCURDY, GEORGE EARLE. 3437 Berkley Ave., Berwyn, Ill..		Sept. 3, 1913
MARSH, CHARLES REED. Supt. of Constr., U. S. Public Bldgs., Treasury Dept., Long Branch, N. J.....	} Jun. Assoc. M.	June 30, 1910
		Dec. 31, 1913
MARTIN, JOSEPH PATRICK. Dist. Engr., U. S. Forest Service, Ogden, Utah.....		Dec. 31, 1913
MILLER, ALEXANDER NORMAN. Engr., The Hinman Hydr. Mfg. Co., 1060 Milwaukee St., Denver, Colo.....		Dec. 31, 1913
MILLS, ADELBERT PHILO. Asst. Prof. of Civ. Eng., Coll. of Civ. Eng., Cornell Univ., Ithaca, N. Y.....	} Jun. Assoc. M.	Sept. 3, 1907
		Sept. 3, 1913

ASSOCIATE MEMBERS (*Continued*)

		Date of Membership.
PAYNE, JAMES ELWOOD. Sales Engr., General Fireproofing Co., 1435 Wick Ave., Youngstown, Ohio.....	} Jun. } Assoc. M.	June 6, 1911 Dec. 31, 1913
PEVERLEY, RALPH ST. LAWRENCE. Engr. and Supt., Snare & Triest Co., P. O. Box 1197, San Juan, Porto Rico.		Dec. 3, 1913
RICE, ROWLAND GRENVILLE. 630 Brown Marx Bldg., Birmingham, Ala.....	} Jun. } Assoc. M.	Mar. 5, 1907 Dec. 3, 1913
STAFFORD, FREDERICK DIAL. Res. Engr., Hales Bar Lock and Dam, Guild, Tenn.....		Dec. 31, 1913
STILES, ALBERT IRVINE. 902 Manteo St., Nor- folk, Va.....	} Jun. } Assoc. M.	Feb. 6, 1906 Dec. 31, 1913
STOCKER, EDWARD CHARLES. Chf. Hydro- grapher, Whangpoo Conservancy, Box 651, American P. O., Shanghai, China..	} Jun. } Assoc. M.	April 4, 1911 Nov. 12, 1913
TEETER, EARLE EVERETT. Junior Engr., U. S. Reclama- tion Service, Las Cruces, N. Mex.....		Dec. 31, 1913
VEATCH, NATHAN THOMAS, JR. Prin. Asst., Worley & Black, 301 Reliance Bldg., Kansas City, Mo.....	} Jun. } Assoc. M.	Nov. 8, 1909 Oct. 1, 1913
WALKER, EDWARD GEORGE. 337 Beverley Rd., Hull, England.....	} Jun. } Assoc. M.	April 2, 1907 Dec. 3, 1913
WENZELL, ANDREW PERRY. Asst. Engr., C. P. Ry., Constr. Dept., Windsor Depot, Montreal, Que., Canada.....		May 7, 1913

JUNIORS

BROWN, GEORGE FRANKLIN. Care, Longview Farm, Lee's Summit, Mo.....		Nov. 12, 1913
CAMPBELL, CHARLES CECIL. Highway Insp., Bureau of Highways, Dept. of Public Works, 870 North Ring- gold St., Philadelphia, Pa.....		Dec. 31, 1913
DALY, ALBERT PETER VINCENT. Care, University Club, Altoona, Pa.....		Dec. 31, 1913
DRURY, WALTER RHODES. 815 East 2d St., Flint, Mich....		Dec. 31, 1913
FEINER, MARK ANTONY. 3143 Broadway, New York City..		Dec. 3, 1913
HATCHER, THOMAS VICTOR. Care, U. S. Reclamation Service, Fort Shaw, Mont.....		Dec. 3, 1913
MELIN, OSCAR WILLIAM. 1014 Sixteenth Ave., Moline, Ill..		Dec. 3, 1913
MORSE, FREDERICK THURLOUGH. 225 South Glendale Ave., Tropico, Cal.....		Nov. 12, 1913
SQUIBB, GEORGE SAMPSON. 12 Kilsyth Rd., Brookline, Mass.		July 2, 1913
STAEHLE, GILBERT COBB. Engr. in Chg., Drafting Room, Concrete Eng. Co., 608 Omaha National Bank Bldg., Omaha, Nebr.....		Dec. 3, 1913
WEBB, CHAUNCEY EARL. Mason, Mich.....		Dec. 31, 1913

RESIGNATIONS

MEMBERS

	Date of Resignation.
FORD, PORTER DWIGHT.....	Dec. 31, 1913

DEATHS

- ARANGO, RICARDO MANUEL. Elected Associate Member, September 2d, 1896; Member, February 6th, 1906; died January 24th, 1914.
- HAYS, JOHN WILLIS. Elected Member, June 5th, 1901; died December 14th, 1913.
- MIX, EDGAR HENRY. Elected Associate Member, April 2d, 1913; died January 7th, 1914.
- PETERSON, PETER ALEXANDER. Elected Member, January 5th, 1876; date of death unknown.
- RIEGNER, WALLACE BERKLEY. Elected Member, September 7th, 1904; died January 19th, 1914.

**Total Membership of the Society, February 5th, 1914,
7 285.**

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(January 6th to February 1st, 1914)

NOTE.—This list is published for the purpose of placing before the members of this Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

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|--|---|
| (1) <i>Journal</i> , Assoc. Eng. Soc., St. Louis, Mo., 30c. | (28) <i>Journal</i> , New England Water-Works Assoc., Boston, Mass., \$1. |
| (2) <i>Proceedings</i> , Engrs. Club of Phila., Philadelphia, Pa. | (29) <i>Journal</i> , Royal Society of Arts, London, England, 6d. |
| (3) <i>Journal</i> , Franklin Inst., Philadelphia, Pa., 50c. | (30) <i>Annales des Travaux Publics de Belgique</i> , Brussels, Belgium, 4 fr. |
| (4) <i>Journal</i> , Western Soc. of Engrs., Chicago, Ill., 50c. | (31) <i>Annales de l'Assoc. des Ing. Sortis des Ecoles Spéciales de Gand</i> , Brussels, Belgium, 4 fr. |
| (5) <i>Transactions</i> , Can. Soc. C. E., Montreal, Que., Canada. | (32) <i>Mémoires et Compte Rendu des Travaux</i> , Soc. Ing. Clv. de France, Paris, France. |
| (6) <i>School of Mines Quarterly</i> , Columbia Univ., New York City, 50c. | (33) <i>Le Génie Civil</i> , Paris, France, 1 fr. |
| (7) <i>Gesundheits Ingenieur</i> , München, Germany. | (34) <i>Portefeuille Economiques des Machines</i> , Paris, France. |
| (8) <i>Stevens Institute Indicator</i> , Hoboken, N. J., 50c. | (35) <i>Nouvelles Annales de la Construction</i> , Paris, France. |
| (9) <i>Engineering Magazine</i> , New York City, 25c. | (36) <i>Cornell Civil Engineer</i> , Ithaca, N. Y. |
| (10) <i>Cassier's Magazine</i> , New York City, 25c. | (37) <i>Revue de Mécanique</i> , Paris, France. |
| (11) <i>Engineering</i> (London), W. H. Wiley, New York City, 25c. | (38) <i>Revue Générale des Chemins de Fer et des Tramways</i> , Paris, France. |
| (12) <i>The Engineer</i> (London), International News Co., New York City, 35c. | (39) <i>Technisches Gemeindeblatt</i> , Berlin, Germany, 0, 70m. |
| (13) <i>Engineering News</i> , New York City, 15c. | (40) <i>Zentralblatt der Bauverwaltung</i> , Berlin, Germany, 60 pf. |
| (14) <i>Engineering Record</i> , New York City, 10c. | (41) <i>Electrotechnische Zeitschrift</i> , Berlin, Germany. |
| (15) <i>Railway Age Gazette</i> , New York City, 15c. | (42) <i>Proceedings</i> , Am. Inst. Elec. Engrs., New York City, \$1. |
| (16) <i>Engineering and Mining Journal</i> , New York City, 15c. | (43) <i>Annales des Ponts et Chaussées</i> , Paris, France. |
| (17) <i>Electric Railway Journal</i> , New York City, 10c. | (44) <i>Journal</i> , Military Service Institution, Governors Island, New York Harbor, 50c. |
| (18) <i>Railway Review</i> , Chicago, Ill., 15c. | (45) <i>Colliery Engineer</i> , Scranton, Pa., 25c. |
| (19) <i>Scientific American Supplement</i> , New York City, 10c. | (46) <i>Scientific American</i> , New York City, 15c. |
| (20) <i>Iron Age</i> , New York City, 20c. | (47) <i>Mechanical Engineer</i> , Manchester, England, 3d. |
| (21) <i>Railway Engineer</i> , London, England, 1s. 2d. | (48) <i>Zeitschrift</i> , Verein Deutscher Ingenieure, Berlin, Germany, 1, 60m. |
| (22) <i>Iron and Coal Trades Review</i> , London, England, 6d. | (49) <i>Zeitschrift für Bauwesen</i> , Berlin, Germany. |
| (23) <i>Railway Gazette</i> , London, England, 6d. | (50) <i>Stahl und Eisen</i> , Düsseldorf, Germany. |
| (24) <i>American Gas Light Journal</i> , New York City, 10c. | (51) <i>Deutsche Bauzeitung</i> , Berlin, Germany. |
| (25) <i>Railway Age Gazette</i> , Mechanical Edition, New York City, 20c. | (52) <i>Rigische Industrie-Zeitung</i> , Riga, Russia, 25 kop. |
| (26) <i>Electrical Review</i> , London, England, 4d. | (53) <i>Zeitschrift</i> , Oesterreichischer Ingenieur und Architekten Ver-eines, Vienna, Austria, 70h. |
| (27) <i>Electrical World</i> , New York City, 10c. | |

- (54) *Transactions*, Am. Soc. C. E., New York City, \$12.
 (55) *Transactions*, Am. Soc. M. E., New York City, \$10.
 (56) *Transactions*, Am. Inst. Min. Engrs., New York City, \$6.
 (57) *Colliery Guardian*, London, England, 5d.
 (58) *Proceedings*, Engrs.' Soc. W. Pa., 2511 Oliver Bldg., Pittsburgh, Pa., 50c.
 (59) *Proceedings*, American Water-Works Assoc., Troy, N. Y.
 (60) *Municipal Engineering*, Indianapolis, Ind., 25c.
 (61) *Proceedings*, Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c.
 (62) *Industrial World*, 59 Ninth St., Pittsburgh, Pa., 10c.
 (63) *Minutes of Proceedings*, Inst. C. E., London, England.
 (64) *Power*, New York City, 5c.
 (65) *Official Proceedings*, New York Railroad Club, Brooklyn, N. Y., 15c.
 (66) *Journal of Gas Lighting*, London, England, 6d.
 (67) *Cement and Engineering News*, Chicago, Ill., 25c.
 (68) *Mining Journal*, London, England, 6d.
 (69) *Der Eisenbau*, Leipzig, Germany.
 (71) *Journal*, Iron and Steel Inst., London, England.
 (71a) *Carnegie Scholarship Memoirs*, Iron and Steel Inst., London, England.
 (72) *American Machinist*, New York City, 15c.
 (73) *Electrician*, London, England, 18c.
 (74) *Transactions*, Inst. of Min. and Metal., London, England.
 (75) *Proceedings*, Inst. of Mech. Engrs., London, England.
 (76) *Brick*, Chicago, Ill., 10c.
 (77) *Journal*, Inst. Elec. Engrs., London, England, 5s.
 (78) *Beton und Eisen*, Vienna, Austria, 1, 50m.
 (79) *Forscherarbeiten*, Vienna, Austria.
 (80) *Tonindustrie Zeitung*, Berlin, Germany.
 (81) *Zeitschrift für Architektur und Ingenieurwesen*, Wiesbaden, Germany.
 (82) *Mining and Engineering World*, Chicago, Ill., 10c.
 (83) *Gas Age*, New York City, 15c.
 (84) *Le Ciment*, Paris, France.
 (85) *Proceedings*, Am. Ry. Eng. Assoc., Chicago, Ill.
 (86) *Engineering-Contracting*, Chicago, Ill., 10c.
 (87) *Railway Engineering and Maintenance of Way*, Chicago, Ill., 10c.
 (88) *Bulletin of the International Ry. Congress Assoc.*, Brussels, Belgium.
 (89) *Proceedings*, Am. Soc. for Testing Materials, Philadelphia, Pa., \$5.
 (90) *Transactions*, Inst. of Naval Archts., London, England.
 (91) *Transactions*, Soc. Naval Archts. and Marine Engrs., New York City.
 (92) *Bulletin*, Soc. d'Encouragement pour l'Industrie Nationale, Paris, France.
 (93) *Revue de Métallurgie*, Paris, France, 4 fr. 50.
 (94) *The Boiler Maker*, New York City, 10c.
 (95) *International Marine Engineering*, New York City, 20c.
 (96) *Canadian Engineer*, Toronto, Ont., Canada, 10c.
 (98) *Journal*, Engrs. Soc. Pa., Harrisburg, Pa., 30c.
 (99) *Proceedings*, Am. Soc. of Municipal Improvements, New York City, \$2.
 (100) *Professional Memoirs*, Corps of Engrs., U. S. A., Washington, D. C., 50c.
 (101) *Metal Worker*, New York City, 10c.
 (102) *Organ für die Fortschritte des Eisenbahnwesens*, Wiesbaden, Germany.
 (103) *Mining and Scientific Press*, San Francisco, Cal., 10c.
 (104) *The Surveyor and Municipal and County Engineer*, London, England, 6d.
 (105) *Metallurgical and Chemical Engineering*, New York City, 25c.
 (106) *Transactions*, Inst. of Min. Engrs., London, England, 6s.
 (107) *Schweizerische Bauzeitung*, Zürich, Switzerland.
 (108) *Southern Machinery*, Atlanta, Ga., 10c.

LIST OF ARTICLES

Bridges.

- Test of a 40-Foot Reinforced Concrete Highway Bridge.* D. A. Abrams. (89) Vol. 13.
 Coal-Tar and Asphalt Products for Waterproofing (Bridges). S. T. Wagner. (89) Vol. 13.
 Doubling the Load Capacity of an Old Iron Railroad Viaduct.* W. T. Curtis. (4) Dec.
 Ludlow Avenue Viaduct, Cincinnati, Ohio.* A. M. Wolf. (87) Jan.
 Langwies Viaduct, Chur-Arosa Ry., Langwies, Switzerland.* A. M. Wolf. (87) Jan.
 Concrete Plant for Bridge Work in the Renewal of Wooden Trestles with Concrete Arches and Fills. R. P. Black. (87) Jan.
 Design and Construction of the St. Croix River Bridge at Hudson, Wis.* (86) Jan. 7.
 The Hell Gate Steel Arch Bridge.* (13) Jan. 8.

*Illustrated.

Bridges—(Continued).

- Steelwork of the Lower Ganges Bridge at Sara, India.* F. C. Coleman. (13) Jan. 15.
- The Pontpédrouse Viaduct.* (13) Jan. 15.
- Replacing a Three-Span Cantilever Bridge by Independent Span.* (14) Jan. 17.
- The St. Lawrence Bridge Company's Shops.* (96) Jan. 22.
- Alternate Designs for New James River Bridge, Richmond, Va.* (13) Jan. 22.
- Billings Bridge over Rideau River, Ottawa, Ont.* (96) Jan. 20.
- The McKellar River Bridge at Fort William. (96) Jan. 29.
- Repairing Fire Damage on the Harriman Bridge at Portland, Oregon. (14) Jan. 31.
- Installation de Lentilles à Graissage sous Pression aux Ponts de Langerbrugge et de Terdonck sur le Canal de Gand à Terneuzen.* J. Haché. (30) Dec.
- Grundsätze über die Berechnung und die Ausführung von Eisenbeton-Rippendecken der Berliner Baupolizei.* (51) Sup. No. 1.
- Die Knicksicherheit in sich versteifter Hängebrücken, sowie des Zwei- und Dreigelenkbogens innerhalb der Tragwandebene.* Rudolf Mayer-Mita. (69) Dec.
- Rechnerische Auflösung Clapeyronscher Gleichungen.* P. M. Fransden. (69) Dec.
- Aesthetische Fragen der Ingenieurkunst, besonders des Eisenbaues.* Georg Chr. Mehrtens. (69) Serial beginning Dec.
- Die neue Brücke über die Westoder bei Mescherin im Zuge des Oderüberganges bei Greifenhagen.* Ostmann. (40) Dec. 17.
- Die neue Strassenbrücke über die Elbe bei Schönebeck.* C. Winterkamp. (48) Serial beginning Dec. 20.
- Die Muotabrücke in Vorder-Ibach.* H. Gubelmann. (107) Dec. 27.
- Ueber die Beanspruchungen Durchgehender Träger durch Wärmeinflüsse und Stützensenkungen. Fr. Engesser. (69) Jan.
- Strassenbrücke in Rahmenkonstruktion.* W. Schmidt. (78) Jan. 3.

Electrical.

- Report of Committee B-1 (Am. Soc. for Testing Materials) on Standard Specifications for Copper Wire.* (89) Vol. 13.
- Municipal Electric Lighting Plants for Cleveland, Ohio. W. A. Springborn. (60) Jan.
- Notes Upon Steel Tower Transmission Lines Location and Construction.* Albert B. Cudebec. (36) Jan.
- The Employment of Power in H. M. Post Office.* H. C. Gunton. (77) Jan. 1.
- Electricity Supply of Large Cities.* G. Klingenberg. (77) Jan. 1.
- The Magnetic Leakage of Sallent Poles.* Robert Pohl. (77) Jan. 1.
- The Rjukan Nitrate Works and Electrical Plant.* (26) Serial beginning Jan. 2.
- Radio Service on the Lackawanna Railroad.* (27) Jan. 10.
- British Practice in the Construction of High-Tension Overhead Transmission Lines.* B. Welbourn. (77) Jan. 15.
- Transmission of Power by Chains.* H. T. Hildage. (Paper read before the Manchester Assoc. of Engrs.) (11) Jan. 16; (47) Jan. 16.
- The Tata Hydro-Electric Scheme.* (26) Jan. 16.
- Electric Service in the Upper Peninsula of Michigan.* (27) Jan. 17.
- Reinforced-Concrete Poles as Cheap as Wood (Toronto Hydro-Electric System).* J. G. Jackson. (27) Jan. 17.
- Distributing Pole with Self-Contained Transformer.* (27) Jan. 17.
- Sag-Temperature Relations in Suspended Conductors.* H. M. Hall. (27) Jan. 24.
- Interconnected Electric Service at Warren, Ohio.* (27) Jan. 24.
- Wireless Time.* E. A. Fath. (46) Jan. 24.
- Storage Batteries, Construction and Maintenance.* W. D. Smoot. (Paper read before the National Assoc. of Stationary Engrs.) (62) Jan. 26.
- Unified Electric Service in Lorain County, Ohio.* (27) Jan. 31.
- Alternating-Current Electromagnets.* Charles R. Underhill. (27) Jan. 31.
- How the Wireless Works.* J. Andrew White. (95) Feb.
- Four 250-Ton Giant Cranes now Under Construction for Use in Shipyards.* (95) Feb.
- Transporteurs Electriques Tubulaires pour Petits Colls.* (33) Dec. 27.
- Elektrisch angetriebene Ventile und ihre Verwendung.* Ernst Claassen. (48) Dec. 6.
- Untersuchungen über das elektromagnetische Kraftfeld. Theodor Gross. (48) Dec. 6.
- Die magnetischen Eigenschaften von Gussseisen.* E. Gumlich. (50) Dec. 25.
- Ueber Schaltungs- und ähnliche Fehler an Drehstromzählern.* Leopold Schnackenburg. (41) Dec. 25.
- Die Entwicklung der Grossgleichrichter der Allgemeinen Elektrizitäts-Gesellschaft.* K. Norden. (41) Dec. 25.
- Fortschritte in der elektrischen Beleuchtungstechnik.* W. Grix. (7) Dec. 27.
- Der Schutzwert von Blitzellen.* W. Petersen. (41) Jan. 1.
- Quecksilber-Grossgleichrichter und die Regulier- und Kommutierungsfrage.* F. W. Meyer. (41) Serial beginning Jan. 1.
- Ueber Fernsprechautomaten.* Teuffert. (41) Jan. 1.

*Illustrated.

Electrical—(Continued).

- Ueber die Berechnung der Selbstkosten des elektrischen Stromes, ein Beitrag zur Theorie und Praxis der Stromtarife.* Hugo Eisenmenger. (41) Jan. 1.
 Beitrag zur Kenntnis des Moorellichtes.* J. Bujes. (41) Jan. 15.
 Die Kondensatormaschine, ein neuer elektrostatischer Erzeuger hochgespannten Gleichstroms.* H. Wommelsdorf. (41) Jan. 15.

Marine.

- On Shipbuilding Contracts. L. Peskett. (90) 1913, Pt. 2.
 On Safety of Life at Sea. Percy A. Hillhouse. (90) 1913, Pt. 2.
 Note on Some Cases of Fatigue in the Steel Material of Steamers.* S. J. P. Thearle. (90) 1913, Pt. 2.
 Effect of Form and Size on the Resistance of Ships.* G. S. Baker and J. L. Kent. (90) 1913, Pt. 2.
 Experiments on Suction or Interaction Between Passing Vessels.* A. H. Gibson and J. Hannay Thompson. (90) 1913, Pt. 2.
 Experimental Determination of the Effect of Internal Loose Water Upon the Rolling of a Ship Amongst a Regular Series of Waves.* A. Cannon. (90) 1913, Pt. 2.
 The Effect of Water-Chambers on the Rolling of Ships.* Lloyd Woollard. (90) 1913, Pt. 2.
 On the Criterion for the Occurrence of Cavitation.* L. Gümbel. (90) 1913, Pt. 2.
 On the Trials of Three Ferry Steamers Propelled by Gerard Turbines.* J. Inglis. (90) 1913, Pt. 2.
 A Device to Facilitate the Coupling of Cruising Turbines. Harold E. Yarrow. (90) 1913, Pt. 2.
 Performance on Service on the Motor-Ship *Suecia*.* I. Knudsen. (90) 1913, Pt. 2.
 A Case for Electric Propulsion.* John Reid and H. A. Mavor. (90) 1913, Pt. 2.
 Standard Specifications for Structural Steel for Ships.* (89) Vol. 13.
 Standard Specifications for Rivet Steel for Ships.* (89) Vol. 13.
 Marine Diesel Oil-Engine (Sulzer Type).* (11) Jan. 2.
 The Motor-Ship *Fionia*.* (11) Jan. 9; (12) Jan. 9; (95) Feb.
 The Use of Oil Fuel in Marine Boilers.* James S. Gander. (Paper read before the Inst. of Marine Engrs.) (47) Serial beginning Jan. 16.
 A Stone-Handling Derrick Boat.* (13) Jan. 22.
 The Unsinkable Ship.* (46) Jan. 24.
 Power Limitations of the Marine Gasolene (Petrol) Engine. Albert H. Ziegler. (95) Feb.
 Diesel-Engined Tugs.* J. Rendell Wilson. (95) Feb.
 The Twin-Screw Steamship *Königin Luise*.* F. C. Coleman. (95) Feb.

Mechanical.

- Large-Capacity Testing Machines in the United States and England.* E. L. Lasier. (89) Vol. 13.
 Results of Tests of Welded Boiler Tubes.* E. L. Lasier. (89) Vol. 13.
 Report of Committee D-11 (Am. Soc. for Testing Materials) on Standard Specifications for Rubber Products. (89) Vol. 13.
 Screen-Scale Sieves Made to a Fixed Ratio.* G. A. Disbro. (89) Vol. 13.
 Some Advantages of Standardization. William H. Spire. (Paper read before the National Gas Engine Assoc.) (108) Jan.
 Some British Cement Plants. (67) Jan.
 Cotton Conveying Systems: Their Safeguards Against Fire.* H. A. Burnham. (55) Jan.
 Report of the Committee of the American Society of Mechanical Engineers on Standardization of Flanges.* (55) Jan.
 The Testing of Coal for Purchase. J. M. Goldman. (Paper read before the Engrs.' Club of St. Louis.) (1) Jan.
 Standard Specifications for Horizontal Return Tubular Boilers. National Tubular Boiler Manufacturers' Assoc. (94) Jan.
 Formulas Used in Laying Out Plate Work.* C. W. R. Eichhoff. (94) Jan.
 100-Ton Steam Travelling Crane for the Havre Harbour Works. (11) Jan. 2.
 The Theory of the Surface Condenser.* (11) Serial beginning Jan. 2.
 Progress in the Application of Compressed Air. Robert Peele. (103) Jan. 3.
 Use of Producer Gas in Periodic Kilns. I. M. Justice. (76) Jan. 6.
 Producer Gas-Fired Continuous Kiln, Advantageous Points.* R. H. McElroy. (76) Jan. 6.
 Oil Fuel. Alfred J. Liversedge. (Abstract from the *International Review*.) (96) Jan. 8.
 Gas Producer Developing 3 000 Horse-Power.* R. M. Chatterton. (20) Jan. 8.
 The Testing of Air Compressors.* H. Keay Pratt. (57) Serial beginning Jan. 9.

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Mechanical—(Continued).

- Worm and Wheel Drives. E. J. Lees. (Abstract of paper read before the Cleveland Eng. Soc.) (47) Jan. 9.
- Exhaust Steam Utilization Plant at the Derwent Works of the Workington Iron and Steel Company, Limited.* (22) Jan. 9.
- How to Harvest Ice Rapidly. Harold B. Wood. (19) Jan. 10.
- Report Presented by Committee on Naphthaline Problem of To-Day. American Gas Institute. (24) Jan. 12.
- Innovation in a Water-Cooled Standing for Sheet and Tin Mills.* (62) Jan. 12.
- Stewarts' Patent Welded Joint for Steel Pipes (for Gas).* (66) Jan. 13.
- Coal and Ash Handling at Pierce-Arrow Plant.* Charles H. Bromley. (64) Jan. 13.
- Moisture in Compressed Air. A. Hofmann. (64) Jan. 13.
- Specifications for the Purchase of Oil.* J. J. McIntosh. (64) Jan. 13.
- Electric vs. Pneumatic Power to Operate Portable Drills and Hoists.* A. G. Popcke. (72) Jan. 15.
- The Still Process of Direct Recovery of Tar and Ammonia from Coke-Oven Gases.* F. Korten. (From *Glückauf*.) (22) Jan. 16.
- Correlation of the Gas-Lighting and Coke-Oven Industries.* J. E. Christopher. (Paper read before the Manchester and District Junior Gas Assoc.) (22) Jan. 16; (66) Jan. 13.
- The Daimler 2-Ton Commercial Chassis.* (11) Jan. 16.
- Conveyors at a Chinese Coal Field.* (12) Jan. 16.
- New Oil Gas Plant of the Portland (Ore.) Gas and Coke Company.* (24) Jan. 19.
- Handling, Storing and Sale of Coke.* J. W. Shaeffer. (Paper read before the Am. Gas Inst.) (24) Jan. 19; (83) Feb. 2.
- Simple Rope Haulage System.* W. A. Hull. (76) Jan. 20.
- Oil Storage and Piping. J. J. McIntosh. (64) Jan. 20.
- Bellevue Hospital Plant.* Thomas Wilson. (64) Jan. 20.
- Notes on the Working of the Woodall-Duckham Installation of Vertical Retorts at Windsor Street, Birmingham.* Charles F. Tooby. (Paper read before the Midland Junior Gas Assoc.) (66) Jan. 20.
- Electrically Operated Steel Coal Pier of Norfolk & Western Railway.* (14) Jan. 24.
- Protection of Street Mains by an Adequate System of Inspection.* C. C. Simpson, Jr. (24) Jan. 26.
- Making a World's Record in Building Large Engines.* (62) Jan. 26.
- Solving the Cinder Problem at Waterside.* Charles H. Bromley. (64) Serial beginning Jan. 27.
- Oil Burners for Power Plant.* J. J. McIntosh. (64) Jan. 27.
- Proposed Aerial Passenger Cableway across the Whirlpool, Below Niagara Falls.* (13) Jan. 29.
- New Pig-Casting Machine.* (20) Jan. 29.
- The Bullard Multi-Au-Matic Vertical Lathe.* (72) Jan. 29.
- Rotating Airship Shed.* (19) Jan. 31.
- Production Engineering in Gas Producer Practice.* C. J. Morrison. (9) Feb.
- The Dial Method of Reducing Machine Production Costs. Frank G. Riehl. (9) Feb.
- Etude sur les Parachutes d'Aviation.* M. Couade. (32) Nov.
- Concours de Pare-Eclaboussures (Anvers 1913).* E. Van Volsom et L. Boereboom. (30) Dec.
- Les Progrès Récents dans la Préparation des Moulages et des Revêtements Métalliques.* P. Nicolardot. (92) Dec.
- V^e Exposition Internationale de Locomotion Aérienne (Paris, 5-25 décembre 1913).* Henri Mirguet. (33) Dec. 20.
- Transporteurs Electriques Tubulaires pour Petits Colis.* (33) Dec. 27.
- Briqueteries.* Pierre Blanc. (35) Jan.
- Concours de Pare-Boue pour Autobus, Organisé par la Ville de Paris (1912-1913).* E. Bret. (33) Serial beginning Jan. 3.
- Grue Electrique de Coulée pour Acières. Ch. Dantfn. (33) Jan. 17.
- Die neue Talbotofen-Anlage der Lackawanna Steel Co. in Buffalo.* H. Groeck. (48) Nov. 29.
- Beanspruchung zylindrischer Schraubenfedern mit Kreisquerschnitt.* A. Röver. (48) Nov. 29.
- Untersuchung über die Luftverteilung einer verzweigten Exhaustoranlage.* D. Eie und H. Ovenberg. (48) Dec. 6.
- Versuche über die Luftwiderstandsarbeit eines Schwungrades.* E. Heinrich. (48) Dec. 6.
- Eine Einzylindermaschine mit Zwischendampfentnahme.* C. Pfeiderer. (48) Dec. 20.
- Das Fünfeck als Grundfigur für Drehkrangerüste.* A. G. Hermann Weidemann. (69) Jan.
- Untersuchungen über Walzdrücke und Kraftbedarf beim Auswalzen von Knüppeln, Winkeln, U- und I-Eisen.* J. Puppe. (50) Jan. 1.

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Mechanical—(Continued).

- Elektrisch gesteuerte Presswasser-Nietmaschinen von Plat.* (102) Jan. 1.
 Kombinierte Wasch- und Zentrifugiermaschinen, Kritische Betrachtungen.* Otto Neumann. (7) Jan. 3.
 Das moderne Siederohrwalzwerk.* (50) Jan. 15.

Metallurgical.

- Report of Committee B-2 (Am. Soc. for Testing Materials) on Non-Ferrous Metals and Alloys. (89) Vol. 13.
 Standard Specifications for Lake Copper Wire Bars, Cakes, Slabs, Billets, Ingots, and Ingot Bars. (89) Vol. 13.
 Standard Specifications for Electrolytic Copper Wire Bars, Cakes, Slabs, Billets, Ingots, and Ingot Bars. (89) Vol. 13.
 Testing of Refractories.* A. V. Bleininger. (89) Vol. 13.
 Lead-Tin-Antimony and Tin-Antimony-Copper Alloys.* William Campbell. (89) Vol. 13.
 Strength of Cast Zinc or Spelter.* Gilbert Rigg and G. M. Williams. (89) Vol. 13.
 A Study of Ore Flotation. Donald G. Campbell. (6) Nov.
 The Roasting of Copper-Nickel Matte.* Edward F. Kern and M. H. Merris. (6) Nov.
 Sintering Processes for Iron-Bearing Materials. B. G. Klugh. (58) Dec.
 Resistivity of Copper in Temperature Range 20° C. to 1450° C.* Edwin F. Northrup. (3) Jan.
 The Making of Sound Steel Ingots.* Bradley Stoughton. (3) Jan.
 The Works of the Electro-Flex Steel Company, Ltd.* (22) Jan. 2.
 Hydro- and Pyro-Metallurgy of Copper in 1913.* Thomas T. Read. (103) Jan. 3.
 Metallurgy of the California Mother Lode. M. M. von Bernwitz. (103) Jan. 3.
 Progress in Gold and Silver Ore Treatment in 1913. Alfred James. (103) Jan. 3.
 Hidden Creek Smelting Works.* C. Carleton Semple. (16) Jan. 3.
 Refractories in the Iron and Steel Industry. Harry W. Croft. (Abstract of paper read before the Am. Iron and Steel Inst.) (47) Jan. 9.
 The Passivity of Metals. (General discussion before the Faraday Soc.) (68) Jan. 10.
 Blast Furnaces of the Reading Iron Company.* (20) Jan. 15.
 Metals and Alloys Used for Die Castings. E. F. Lake. (47) Jan. 16.
 The Cerro de Pasco Smelting Plant.* Spencer Bishop. (103) Jan. 24.
 New Large-Type Herreshoff Roasting Furnace.* (16) Jan. 31.
 Chemicals Used in the Cyanide Process. Herbert A. Megraw. (16) Jan. 31.
 Iron and Steel Making in America, Its Fundamentals and Its Future.* L. DeG. Moss. (9) Feb.
 La Métallurgie à l'Exposition de Gand.* J. Saconney. (93) Dec.
 Sur les Transformations du Fer et des Aciers aux Températures Élevées.* Kôtarô Honda et Hiromu Takagi; tr. by M. Fournel. (93) Dec.
 Influence du Traitement Thermique sur les Propriétés de l'Acier Ecroui. P. Goerens; tr. by J. Dumont et J. Paquet. (Paper read before L'Institut Sidéurgique d'Aix-la-Chapelle.) (93) Dec.
 Nouvel Appareil pour la Pulvérisation des Métaux, Procédé Schoop.* Victor Bernard. (93) Dec.
 Das Hochofenwerk Lübeck.* H. Groeck. (48) Dec. 6.

Military.

- Tests of the Bangalore Torpedo.* F. B. Wilby. (From *Royal Engineers Journal*.) (100) Jan.

Mining.

- Suggestions as to Standard Specifications to Promote Efficiency and Safety in Explosives Used in Blasting. C. P. Beistle. (89) Vol. 13.
 Design of Mine Shaft Linings.* William Archie Weldin. (58) Dec.
 Pithead Baths at the Atherton Collieries, Lancashire.* (57) Jan. 2.
 Choice of Electrical Machinery for Use in Mines. J. P. C. Kivlen. (Paper read before the Assoc. of Min. Elec. Engrs.) (22) Jan. 2.
 Mining Methods and Practice.* E. H. Leslie. (103) Jan. 3.
 The Decline of the Rand.* H. S. Denny. (103) Jan. 3.
 Electric Winding (Mines).* James Gillespie. (Paper read before the Assoc. of Min. Elec. Engrs.) (22) Jan. 9.
 Gold Dredging in the United States.* Charles Janin. (103) Jan. 10.
 Deep Mine Pumping and Air Lifts.* A. E. Chodsko. (103) Jan. 17.
 Thawing Frozen Ground for Placer Mining.* Arthur Gibson. (103) Jan. 17.
 Butte Cages and Details of Their Design.* Claude T. Rice. (82) Jan. 17.
 Yamagano Gold Mine, Satsuma, Japan.* Taro M. Yoshida. (16) Serial beginning Jan. 17.
 Aerial Transportation at the Irvine Bank Mine, Queensland.* (16) Jan. 17.

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- The Hand-Hammer Drill, Its Advantages and Limitations. (14) Jan. 24.
 Gold Dredging at Mammoth Bar, California.* Lewis H. Eddy. (16) Jan. 24.
 Stockpiling on the Mesabi.* C. M. Haight. (16) Jan. 31.
 Hydraulic Flume of Boise King Placers Co.* Arthur W. Stevens. (16) Jan. 31.

Miscellaneous.

- Report of Committee E-5 (Am. Soc. for Testing Materials) on Regulations Governing the Form but not the Substance of Specifications. (89) Vol. 13.
 Report of Committee E-6 (Am. Soc. for Testing Materials) on Papers. (89) Vol. 13.
 The Application of Specifications. Robert W. Hunt. (89) Vol. 13.
 The Status of the Engineer. Edward E. Wall. (Paper read before the Engrs.' Club of St. Louis.) (1) Jan.
 Textile Cost Accounting: Its Purpose and Application. C. B. Annett and C. F. Cunningham. (55) Jan.
 Efficiency in Technical Education a Factor in the Development of Professional Ideals. W. F. M. Goss. (55) Jan.
 Contracts and Specifications from the Standpoint of the Contractor. C. A. Crane. (Paper read before the Soc. of Mun. Engrs. of Phila.) (96) Jan. 8.
 New Legislation and Accounts. Adolphe Rafter. (83) Jan. 15.
 L'Industrie et les Emplois du Radium.* Paul Besson. (32) Nov.

Municipal.

- Relation Between the Tests for the Wearing Qualities of Road-Building Rocks.* L. W. Page. (89) Vol. 13.
 Extractor for Bituminous Paving Mixtures.* C. N. Forrest. (89) Vol. 13.
 Report of Committee D-4 (Am. Soc. for Testing Materials) on Standard Tests for Road Materials. (89) Vol. 13.
 Proposed Standard Specifications for Paving Bricks.* (89) Vol. 13.
 Petrographic Range of Road-Building Materials. Charles P. Berkey. (6) Nov.
 Paving Methods in Baltimore.* Harry D. Williar, Jr., Assoc. M. Am. Soc. C. E. (60) Jan.
 Creosoted Wood Block Paving in New York. H. W. Durham. (60) Jan.
 The Design of a Street Intersection.* Paul E. Kressly. (60) Jan.
 Stone-Gravel Road Costs. K. I. Sawyer. (60) Jan.
 Motor Trucks on Street Work.* (60) Jan.
 An Engineer's Report on Some Features of Municipal Engineering Works in Europe. George Janin. (104) Jan. 2.
 Methods and Costs of Maintaining Cement Concrete Roads with Bituminous Surfaces. Herbert C. Poore. (86) Jan. 7.
 Factors Governing the Selection of a Road Surface or Pavement. L. R. Grabill. (Paper read before the Am. Road Builders' Assoc.) (96) Jan. 8.
 The Selection of a Road Surface. W. A. McLean. (Paper read before the Am. Road Builders' Assoc.) (96) Jan. 8.
 Experimental Road Construction in Scotland.* J. Walker Smith and David Ronald. (Paper read before the Institution of Mun. and County Engrs.) (104) Jan. 9.
 Methods and Costs of Constructing the Byberry and Bensalem Service Test Road, Philadelphia, Pa. (86) Jan. 14.
 Blast-Furnace Slag as a Foundation for Paved Streets.* Harvey S. Brown. (13) Jan. 15.
 Direction Posts Competition.* (104) Jan. 16.
 Noise of Brick Pavements, Comments on Experience of Baltimore Paving Commission. R. Klieh Compton. (14) Jan. 17.
 Caliche Roads near Phoenix.* (14) Jan. 17.
 Methods and Costs of Constructing an Experimental Clay-Macadam Road at Pomeroy, Wash. J. E. Tupper. (86) Jan. 21.
 The Engineer-Manager Plan of Municipal Government as Successfully Applied at Abilene, Kans. Kenyon Riddle. (Paper read before the Kansas Eng. Soc.) (86) Jan. 21; (14) Jan. 31.
 Value of Melting Point Test of Bituminous Materials. H. B. Pullar, Assoc. Am. Soc. C. E. (Paper read before the Am. Assoc. for the Advancement of Science.) (96) Jan. 22.
 Asphalt Repairs in Dayton, Cost Analysis. (14) Jan. 24.
 Highway Work in Massachusetts, Statement Covering Construction and Maintenance during Year Ended November 30, 1913. (14) Jan. 24.
 Protection of Street Mains by an Adequate System of Inspection.* C. C. Simpson, Jr. (Paper read before the Am. Gas Inst.) (24) Jan. 26.
 Some Principles Pertaining to the Administration and Financing of Highway Construction and Maintenance. E. A. Stevens. (Paper read before the Am. Road Builders' Assoc.) (86) Jan. 28.
 Methods and Cost of Constructing a Petrolithic Pavement in Cudahy City, Cal. C. G. Varcoe. (86) Jan. 28.

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The first-mentioned field for investigation was the question of the possibility of a general strike in the coal fields of the United States. The first-mentioned field for investigation was the question of the possibility of a general strike in the coal fields of the United States.

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Municipal.

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- Comparison of Wood Paving in European Countries and in America. S. R. Church. (Abstract of paper read before the Am. Wood Preservers' Assoc.) (96) Jan. 29; (13) Jan. 29.
- The Construction of Creosoted Wood-Block Pavements. R. S. Manley. (Abstract of paper read before the Am. Wood Preservers' Assoc.) (13) Jan. 29.
- Laying Brick Paving on a Street with Level Grade.* Jent G. Thorne. (13) Jan. 29.
- Die Wirtschaftlichkeit einer kommunalen Elektrizitäts- und Heizungsanstalt.* L. Schneider. (7) Dec. 20.
- Die Strasse in der Gartenstadt und Kleinhaussiedlung.* Althoff. (39) Jan. 5.
- Abnutzversuche mit Beton- und Klinkerpflaster.* (80) Jan. 13.

Railroads.

- Conservation and Shipping Containers.* B. W. Dunn. (89) Vol. 13.
- Standard Specifications for Rail-Steel Concrete Reinforcement Bars. (89) Vol. 13.
- Standard Specifications for Cold-Rolled Steel Axles.* (89) Vol. 13.
- Standard Specifications for Wrought Solid Carbon Steel Wheels for Electric Railway Service.* (89) Vol. 13.
- Report of the Investigation of Wrought Steel Wheels (Am. Soc. for Testing Materials). (89) Vol. 13.
- Rail Failures and Their Causes.* M. H. Wickhorst. (89) Vol. 13.
- Shop Output. J. H. Tinker. (61) Nov. 17.
- Constructing and Using Temporary Turnouts Without Frogs and Switches.* Andrew Palm. (87) Jan.
- 4-4-0 Superheated Locomotives; Great Northern R. (Ireland).* (21) Jan.
- 2-6-0 "Mogul" Express Goods Engine, London, Brighton and South Coast Railway.* (21) Jan.
- 4-4-0 and 4-6-0 Engines; London and South Western Railway.* (21) Jan.
- Latest Type of Compound Express Locomotives for the Paris-Mediterranean Railway.* (21) Jan.
- Swindon System of Railway Carriage Heating, Great Western Railway.* (21) Jan.
- Gardenville Classification Yard.* (87) Jan.
- Signal Standards, Missouri Pacific Railroad.* (87) Jan.
- The Use of Autogenous Welding in Railway Repair Shops. Th. Kautny. (Paper read before the German Soc. of Mech. Engrs.) (From *Annalen für Gewerbe und Bauwesen*.) (88) Jan.
- Locomotive Boiler Inspection. (Abstract of Report of the Chief Inspector of Locomotive Boilers.) (94) Jan.
- Rail Motor Cars in Use on the Prussian-Hessian State Railway.* Weyand. (From *Elektrische Kraftbetriebe und Bahnen*.) (88) Jan.
- Electrification of the Giovi Line.* (12) Jan. 2.
- Electrification of London & North-Western Railway Suburban Lines.* (23) Jan. 2.
- The Flying Junction at Earl's Court.* (23) Jan. 2.
- 0-6-4 Type Tank Engine for the Federated Malay States Railways.* (23) Jan. 2.
- The Kiangsu-Chekiang Railways.* (23) Jan. 2.
- The New Great Western Railway Station at Birmingham.* (11) Serial beginning Jan. 2.
- Working Experiences of Electric Traction in the Simpon Tunnel. Bruno Kilchenmann. (Abstract from *Elektrische Kraftbetriebe und Bahnen*.) (73) Jan. 2.
- New Car and Locomotive Repair Plant, Boston & Maine R. R.* (18) Jan. 3.
- Pacific Type Locomotives for the Erie Railroad.* (18) Jan. 3.
- Construction Work on the National Transcontinental Railway of Canada.* (18) Serial beginning Jan. 3.
- Apparatus for Repairing the Tubes and Flues of Superheater Locomotives.* (18) Jan. 3.
- Railway Signal-Interlocking Plants. (13) Jan. 8.
- New 90-lb. Rail Section; Denver & Rio Grande R. R.* (13) Jan. 8.
- Steam Circulating System for Superheaters, Tasmanian Government Railways.* (12) Jan. 9.
- Master-Clocks and Headway Recorders for Railways.* (11) Jan. 9.
- L. and Y. Railway Signalling School.* (12) Jan. 9.
- Certain Considerations in Railway Rate-Making. Balthasar H. Meyer. (Paper read before the Am. Economic Assoc.) (15) Jan. 9.
- Recent Power for the Rock Island Lines.* W. J. Tollerton. (15) Jan. 9.
- Steel Passenger Car Situation in the United States. (23) Jan. 9.
- New Mineral Locomotive, Great Northern Railway.* (23) Jan. 9.
- The Automatic Signalling on the Panama Railroad.* W. H. Fenley. (23) Jan. 9.
- Oil Burning Locomotives in the Argentine; Comparative Tests. (23) Jan. 9.
- Fighting a Stubborn Tunnel Fire.* (14) Jan. 10.
- Dynamometer Car for the Erie Railroad.* (18) Jan. 10.
- A New Mechanical Tunneling Machine.* (46) Jan. 10.
- New Interurban Railway in the Minnesota Iron Range.* (17) Jan. 10.
- A Comparison of Results of Different Methods Used in Computing Earthwork Overhaul. Frank Gahrtz. (86) Jan. 14.
- Cost Data on Lining Two Tunnels. George Harper. (86) Jan. 14.

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- Railway Tunnelling.* Leonard Goodday. (96) Jan. 15.
 The Four-Mile Mont d'Or Tunnel, French Jura; Heavy Water-Flow in Firm Rock.* (13) Jan. 15.
 Railways in Time of War. J. A. Longridge. (Abstract from *Army Review*.) (23) Jan. 16.
 New Tank Locomotive, South Eastern & Chatham Railway.* (23) Jan. 16.
 Heavy Improvement Work on the Erie.* (15) Jan. 16.
 The State Railroad Maps of the United States. Leon Dominian. (15) Jan. 16.
 Public Relations of the Railways, the Industries and the Banks. Harry A. Wheeler. (Paper read before the National Industrial Traffic League.) (15) Jan. 16.
 Double-Scissors Cross-Over; Buenos Ayres Great Southern Railway.* (11) Jan. 16; (12) Jan. 16.
 Automatic Train Control, Great Western Railway.* (12) Jan. 16.
 Ortonville-Milbank Alignment Revision.* F. W. Van Buskirk. (14) Jan. 17.
 The Underground Survey Work for the Mount Royal Tunnel.* J. L. Busfield. (96) Jan. 22.
 Methods of Keeping Cross Tie Records.* E. T. Howson. (Paper read before the Am. Wood Preservers' Assoc.) (15) Jan. 23.
 The Burning Out of a Tunnel on the Southern Pacific.* (15) Jan. 23.
 Improving Movement of Freight Cars. E. D. Levy. (15) Jan. 23.
 Steel Underframe Cars for the Grand Trunk.* (15) Jan. 23.
 Should Commerce Commission Initiate Rates? Charles A. Prouty. (Abstract of paper read before the Traffic Club.) (15) Jan. 23.
 Features of Piedmont & Northern Electric Lines.* (14) Jan. 24.
 Kansas City, Clay County & St. Joseph Interurban Railway.* (18) Jan. 24.
 McKeen Motor Cars for the Sunset-Central Lines.* (18) Jan. 24.
 Mikado Type Locomotives for the Duluth & Iron Range R. R.* (18) Jan. 24.
 Motor-Operated Steel Dump Cars.* (17) Jan. 24.
 The Moffat Tunnel as a Denver Municipal Problem. (13) Jan. 29.
 Multiple-Body Electric Dump Cars.* (13) Jan. 29.
 Important Features in Refrigerator Car Design.* (15) Jan. 30.
 The St. Louis & San Francisco Receivership. (15) Jan. 30.
 New Great Northern Station at Minneapolis, Minn.* (15) Jan. 30.
 The Industrial Railways Case. (15) Jan. 30.
 Commission's Investigation of Private Car Lines. (15) Jan. 30.
 New York Court Sustains Advanced Fares (New York, New Haven & Hartford R. R.). (15) Jan. 30.
 Skylights in Jersey City Trainshed.* (14) Jan. 31.
 Protection of Ties from Mechanical Destruction. Howard F. Weiss. (14) Jan. 31.
 Les Nouvelles Locomotives Electriques de la Ligne Milan-Varese (Chemins de fer de l'Etat italien).* (33) Dec. 20.
 Les Récentes Prescriptions Ministérielles Relatives à la Sécurité de l'Exploitation des Voies Ferrées. J. Trévières. (33) Dec. 27.
 Note sur le Souterrain du Mont d'Or.* M. Maguin. (38) Jan.
 Locomotive type "Consolidation" compound à Quatre Cylindres.* (34) Jan.
 Les Chemins de Fer Electriques d'Intérêt Local du Haut-Rhin, dans la Région de Belfort.* (33) Jan. 17.
 Die selbsttätige Kupplung der Eisenbahnfahrzeuge.* C. Guillery. (48) Nov. 29.
 Die Drahtseilbahn Engelberg-Gerschnalp und die neue Bobschlittenbahn.* F. Hunziker. (48) Serial beginning Dec. 13.
 Güterwagen-Hauptwerkstätte in Nürnberg-Verschleppbahnhof, Werkstätteninspektion IV Nürnberg.* Naderer. (102) Dec. 15.
 Ueberhöhung des ausseren Schienenstranges in Gleisbogen.* A. Hofmann. (102) Dec. 15.
 Die Furkabahn (Brig-Andermatt-Disentis).* Oder. (40) Dec. 17.
 Seitliche Beweglichkeit des Drehzapfens zweiachsiger Drehgestelle von Lokomotiven.* W. Monitsch. (102) Jan. 1.
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 Die elektrische Traktion der Berner Alpenbahn-Gesellschaft (Bern-Lötschberg-Simplon).* L. Thormann. (107) Serial beginning Jan. 10.

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- The Shortest Train-Intervals on Urban Quick-Transit Railways, with Special Reference to the Length of the Trains.* W. Bethge. (From *Elektrische Kraftbetriebe und Bahnen*.) (88) Jan.
 Proposed Tunnel Under the Mersey.* (12) Jan. 9.

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- Railway Tunnelling.* Leonard Goodday. (96) Jan. 15.
 The Four-Mile Mont d'Or Tunnel, French Jura; Heavy Water-Flow in Firm Rock.* (13) Jan. 15.
 Railways in Time of War. J. A. Longridge. (Abstract from *Army Review*.) (23) Jan. 16.
 New Tank Locomotive, South Eastern & Chatham Railway.* (23) Jan. 16.
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 The State Railroad Maps of the United States. Leon Dominian. (15) Jan. 16.
 Public Relations of the Railways, the Industries and the Banks. Harry A. Wheeler. (Paper read before the National Industrial Traffic League.) (15) Jan. 16.
 Double-Scissors Cross-Over; Buenos Ayres Great Southern Railway.* (11) Jan. 16; (12) Jan. 16.
 Automatic Train Control, Great Western Railway.* (12) Jan. 16.
 Ortonville-Milbank Alignment Revision.* F. W. Van Buskirk. (14) Jan. 17.
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 Methods of Keeping Cross Tie Records.* E. T. Howson. (Paper read before the Am. Wood Preservers' Assoc.) (15) Jan. 23.
 The Burning Out of a Tunnel on the Southern Pacific.* (15) Jan. 23.
 Improving Movement of Freight Cars. E. D. Levy. (15) Jan. 23.
 Steel Underframe Cars for the Grand Trunk.* (15) Jan. 23.
 Should Commerce Commission Initiate Rates? Charles A. Prouty. (Abstract of paper read before the Traffic Club.) (15) Jan. 23.
 Features of Piedmont & Northern Electric Lines.* (14) Jan. 24.
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 The Moffat Tunnel as a Denver Municipal Problem. (13) Jan. 29.
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 Les Nouvelles Locomotives Electriques de la Ligne Milan-Varese (Chemins de fer de l'Etat italien).* (33) Dec. 20.
 Les Récentes Prescriptions Ministérielles Relatives à la Sécurité de l'Exploitation des Voies Ferrées. J. Trévières. (33) Dec. 27.
 Note sur le Souterrain du Mont d'Or.* M. Maguin. (38) Jan.
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 Les Chemins de Fer Electriques d'Intérêt Local du Haut-Rhin, dans la Région de Belfort.* (33) Jan. 17.
 Die selbsttätige Kupplung der Eisenbahnfahrzeuge.* C. Guillery. (48) Nov. 29.
 Die Drahtseilbahn Engelberg-Gerschnialp und die neue Bobschlittenbahn.* F. Hunziker. (48) Serial beginning Dec. 13.
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 Seitliche Beweglichkeit des Drehzapfens zweiachsiger Drehgestelle von Lokomotiven.* W. Monitsch. (102) Jan. 1.
 Die Elektrisierung der bayerischen Staatseisenbahnen und der Ausbau der bayerischen Wasserkraftanlagen. Zehme. (41) Jan. 1.
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 Die elektrische Traktion der Berner Alpenbahn-Gesellschaft (Bern-Lötschberg-Simplon).* L. Thormann. (107) Serial beginning Jan. 10.

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- The Shortest Train-Intervals on Urban Quick-Transit Railways, with Special Reference to the Length of the Trains.* W. Bethge. (From *Elektrische Kraftbetriebe und Bahnen*.) (88) Jan.
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- Rapid Transit Report in Philadelphia.* (17) Jan. 10.
 New Steel Cars for Chicago Elevated Railways.* (17) Jan. 10.
 Mitigating Electrolysis from Street-Railway Currents. E. B. Rosa and Burton M'Cullom. (14) Jan. 10.
 Subway and Elevated Railway Construction in Philadelphia.* (86) Jan. 14.
 An Electrolysis Test on a System of Insulated Negative Feeders in St. Louis.* E. B. Rosa, Burton M'Cullom and K. H. Logan. (17) Jan. 17.
 Louisville Center-Entrance Car.* (17) Jan. 17.
 Prison Car Built by the Montreal Tramways.* (17) Jan. 17.
 Suburban Fare Zones on Milwaukee System.* (17) Jan. 24.
 The Pittsburgh & Butler Street Railway.* (17) Jan. 24.
 Report of Arbitration Board on Boston Elevated Railway. (17) Jan. 24.
 Street Railway Traffic Surveys in Relation to Railway Operation, Management and Regulation. C. M. Larson. (Paper read before the Wisconsin Elec. Assoc.) (17) Jan. 24.

Sanitation.

- Report of Committee C-4 (Am. Soc. for Testing Materials) on Standard Specifications and Tests for Clay and Cement Sewer Pipes. (89) Vol. 13.
 Report of Committee C-6 (Am. Soc. for Testing Materials) on Standard Tests and Specifications for Drain Tile.* (89) Vol. 13.
 The Erie and Ontario Sanitary Canal Project.* J. Edward Thebaud. (36) Jan. Drainage and Ditching.* T. F. Stewart. (87) Jan.
 The Refuse Destructor at Northampton, England.* (60) Jan.
 Sewage Disposal at Chambersburg, Pa.* (60) Jan.
 Results of a Study Made to Determine the Most Economical Motive Power for Pumping Sewage at Lynn, Mass.* Frank H. Carter, Assoc. M. Am. Soc. C. E. (86) Jan. 7.
 Valuation of the Sewers of Manhattan Borough, New York City.* Otto Hufeland. (13) Jan. 8.
 Presidential Address. John D. Watson. (Paper read before the Inst. of San. Engrs.) (104) Jan. 9.
 Heating, Ventilating and Humidifying Costs. Frank L. Busey. (101) Jan. 9.
 Features of Sewage Disposal Plants.* (101) Serial beginning Jan. 9.
 A \$1 000 000 Land Reclamation Project (Yalo Basin, Cal.).* (86) Jan. 14.
 \$3 000 000 to be Expended for Sewer Construction at Cincinnati, O. H. S. Morse. (From Report to the City.) (86) Jan. 14.
 New Pumps for the New Orleans Drainage System.* (13) Jan. 15.
 New Garbage and Refuse Incinerator for San Francisco. L. H. Nishkian and H. A. Minton. (13) Jan. 15.
 Garbage Disposal Costs. (96) Jan. 15.
 Elements of Heating. E. N. Irwin. (64) Jan. 20.
 The Design and Construction of a Plant for Complete Treatment of Sewage. Chester County Home, Pennsylvania.* P. E. Mebus and F. R. Berlin. (86) Jan. 21.
 Some Important Features in the Design and Operation of Imhoff Sedimentation and Sludge Digestion Sewage Tanks.* Charles Gilman Hyde. (From *Pacific Municipalities*.) (86) Jan. 21.
 Object and General Features of the Sewage Treatment Experiment Station at the University of Michigan. William C. Hoad. (From *Bulletin*, Michigan State Board of Health.) (86) Jan. 21.
 191 Miles of Drainage Ditches in Chittenden County.* (86) Jan. 21.
 Hamilton West End Sewage Disposal Works.* Bernard E. T. Ellis. (96) Jan. 22.
 Features of a \$3 000 Furnace Heating System.* (101) Jan. 23.
 Central Heating Plant for Farm Buildings.* A. M. D. (101) Jan. 23.
 Proposed Refuse-Disposal Plant at Trenton, Hering & Gregory Recommend 120-Ton Incinerator, Which will Supply Steam for Driving Sewage Pumps and Clinker for Concrete. (14) Jan. 24.
 Economy in Cleaning Catchbasins, Motor Truck Fitted with Orange-Peel Bucket and Boom in Use by Pawtucket Municipal Department. (14) Jan. 24.
 Paths of Sewage Currents in New York Bay Tested, Results of Float Observations by Metropolitan Sewerage Commission. (14) Jan. 24.
 Drainage of the Florida Everglades.* Isham Randolph, Marshall O. Leighton and Edmund T. Perkins. (Report to the Board of Comms. of the Everglades Drainage District.) (86) Jan. 28; (14) Jan. 24; (13) Jan. 15.
 Relation of Purity of Water-Supply to Typhoid Fever at Cincinnati, Ohio. J. W. Ellms. (Abstract from *American Journal of Public Health*.) (13) Jan. 29.
 Heat Transmission in Pressed Radiators.* John R. Allen. (Paper read before the Am. Soc. of Heating and Ventilating Engrs.) (101) Jan. 30.
 Sanitary Survey of Boundary Waters between United States and Canada, Report by Experts of International Joint Commission. (14) Jan. 31.
 Central-Station Heating. Jay Grant De Remer. (9) Feb.

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- L'Assèchement des Terrains Aquifères. Th. Verstraeten. (31) Pt. 3, 1913.
 Ueber Strassensinkkasten.* Viktor Schmah. (7) Dec. 6.
 Puffsaugheber für Strassen-Schachtschlamm. (7) Dec. 6.
 Die Aufstellung von Rentabilitätsberechnungen für Badeanstalten und die Berechnung der Selbstkosten für die Bäder. H. Recknagel. (7) Dec. 6.
 Die badetechnischen Einrichtungen im städtischen "Kaiser-Friedrich-Bad" in Wiesbaden.* C. Friedrich. (7) Dec. 13.
 Einsturz eines Abwasserkanals in St. Louis.* Julius Barth. (80) Dec. 18.
 Die Konstruktionshöhe der Trenndecken in Klärbrunnen und Klarbecken.* Paul Schmitt. (7) Dec. 20.
 Ueber die Bleivergiftung eines Dorfes durch Leitungswasser. M. Neisser. (7) Dec. 20.
 Verbesserung der ungesunden Wohnverhältnisse in Hamburg.* (39) Dec. 20.
 Wärmeaustausch-Diagramm und seine Anwendung auf die Theorie der Luftwäscher.* N. W. Akimoff. (7) Jan. 3.
 Ueber das Zusammenarbeiten von Elektrizitätswerk und Kanalpumpstation. Thalenhorst. (39) Jan. 5.
 Die Warmwasserversorgungsanlagen für Privathäuser.* C. A. Gullino. (7) Jan. 10.

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- Standard Specifications for Blooms, Billets and Slabs for Carbon-Steel Forgings. (89) Vol. 13.
 Standard Specifications for Wrought-Iron Plates. (89) Vol. 13.
 Tentative Specifications for Cold-Drawn Steel. (89) Vol. 13.
 Effect of Size of Section on Physical Properties Developed by Heat Treatment.* J. H. Nead. (89) Vol. 13.
 Heat Treatment of Hypo-Eutectoid Carbon-Steel Castings.* J. H. Hall. (89) Vol. 13.
 Mechanical Tests of Heat-Treated Spring Steel.* R. P. Devries. (89) Vol. 13.
 Resistance of Steels to Wear in Relation to Their Hardness and Tensile Properties.* George L. Norris. (89) Vol. 13.
 Magnetic Criteria of the Mechanical Properties of a One-Per-Cent. Carbon Steel.* Charles W. Burrows. (89) Vol. 13.
 Standard Specifications for Medium-Carbon Steel Splice Bars.* (Am. Soc. for Testing Materials.) (89) Vol. 13.
 Standard Specifications for High-Carbon Steel Splice Bars.* (Am. Soc. for Testing Materials.) (89) Vol. 13.
 Report of Committee C-1 (Am. Soc. for Testing Materials) on Standard Specifications for Cement. (89) Vol. 13.
 Report of Committee C-2 (Am. Soc. for Testing Materials) on Reinforced Concrete. (89) Vol. 13.
 Study of Bearing Metals and Methods of Testing.* T. D. Lynch. (89) Vol. 13.
 Estimation of Fine Particles in Cement by Rate of Hydration. H. S. Spackman. (89) Vol. 13.
 Thermal Activities of Portland Cement During the Period of Setting.* Louis N. Beals, Jr. (89) Vol. 13.
 Results Obtained with the Autoclave Tests for Cement.* H. J. Force. (89) Vol. 13.
 Report of Sub-Committee C (Am. Soc. for Testing Materials) on Paint Vehicles. (89) Vol. 13.
 Report of Sub-Committee E (Am. Soc. for Testing Materials) on Linseed Oil. (89) Vol. 13.
 Standard Specifications for the Purity of Raw Linseed Oil from North American Seed. (89) Vol. 13.
 Proposed Standard Definitions of Terms Used in Paint Specifications. (89) Vol. 13.
 Report of Sub-Committee J (Am. Soc. for Testing Materials) on the Testing of White Paints.* (89) Vol. 13.
 Testing of Chinese Wood Oil. E. W. Boughton. (89) Vol. 13.
 Observations on the Testing of Sand.* W. B. Reinke. (89) Vol. 13.
 Action of Various Substances on Cement Mortars. Richard K. Meade. (89) Vol. 13.
 Tests of Natural Concrete Aggregates. R. S. Greenman. (89) Vol. 13.
 Tests of Mortars Made from Wisconsin Aggregates.* M. O. Withey. (89) Vol. 13.
 Report of Committee A (Am. Soc. for Testing Materials) on Standard Specifications for Steel. (89) Vol. 13.
 Proposed Changes in Present Standard Specifications for Steel. (89) Vol. 13.
 Condensed Report of the Investigation of Reinforcing Bars Rerolled from Steel Rails.* W. K. Hatt. (89) Vol. 13.
 Oxygen in Iron and Steel: Value of Existing Methods for Its Determination.* W. R. Fleming. (89) Vol. 13.

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- Report of Committee D-8 (Am. Soc. for Testing Materials) on Waterproofing Materials. (89) Vol. 13.
- Notes on the Property of Toughness of Metals.* Albert F. Shore. (89) Vol. 13.
- Tests on the Rate of Corrosion of Metals. A. W. Carpenter. (89) Vol. 13.
- Tests of Reinforced Concrete Slabs Under Concentrated Loading.* A. T. Goldbeck. (89) Vol. 13.
- Spherical Bearings.* Mont Schuyler. (89) Vol. 13.
- Use of the Strain Gage in the Testing of Materials. W. A. Slater and H. F. Moore. (89) Vol. 13.
- Method and Apparatus for Determining Consistency.* Cloyd M. Chapman. (89) Vol. 13.
- Outline of a Test for Indicating the Relative Priming and Top-Coat Values of Different Paints.* M. McNaughton. (89) Vol. 13.
- Report of the Joint Committee (Am. Soc. for Testing Materials) on Concrete and Reinforced Concrete.* (89) Vol. 13.
- Report of Committee C-3 (Am. Soc. for Testing Materials) on Standard Specifications for Brick.* (89) Vol. 13.
- Proposed Standard Specifications for Building Brick. (89) Vol. 13.
- Report of Committee C-7 (Am. Soc. for Testing Materials) on Standard Specifications for Lime. (89) Vol. 13.
- Proposed Standard Specifications for Lime. (89) Vol. 13.
- Report of Committee D-1 (Am. Soc. for Testing Materials) on Preservative Coatings for Structural Materials. (89) Vol. 13.
- Report of Sub-Committee B (Am. Soc. for Testing Materials) on Inspection of the Havre de Grace Bridge. (89) Vol. 13.
- Concrete Laid in Freezing Weather, New York State Barge Canal. D. A. Watt, M. Am. Soc. C. E. (100) Jan.
- Protective Paints and Pigments. D. F. Leary. (Paper read before the Technical Society of the Pacific Coast.) (1) Jan.
- Concrete in Sea Water on New England Coast. Frederic V. Abbott, M. Am. Soc. C. E. (100) Jan.
- Results of Field Tests of Concrete Disintegration by Immersion in Salt Water.* P. H. Bates, A. J. Phillips and Rudolph J. Wig. (From *Technologic Paper* No. 12, U. S. Bureau of Standards.) (67) Jan.
- Specifications for Factory Timbers.* F. J. Hoxie. (55) Jan.
- The Measurement of Stresses in Materials and Structures.* E. G. Coker. (29) Serial beginning Jan. 2.
- Foundations for the Morgan Building, New York City.* (13) Jan. 8.
- Wooden Structures.* J. A. Macdonald. (96) Jan. 8.
- Extending the Use of the Brinnell Ball Test for Metals. John W. Haig. (72) Jan. 8.
- How the Strength of Wood is Tested in Construction. A. H. D. Ross. (96) Jan. 8.
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- Girard Point Grain Elevator.* (14) Jan. 10.
- Analysis of Reinforced-Concrete Chimneys under Earthquake Stresses. J. Alden Griffin. (14) Jan. 10.
- Data and Cost of Driving Piling for a Five-Story Bank and Office Building at Chickasha, Okla.* F. O. Kirby. (86) Jan. 14.
- Service Work in Varnish Shop.* Robert Mawson. (72) Jan. 15.
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- Steel Arch Erection for an Armory at Kingsbridge, New York City.* (13) Jan. 22.
- Reconstruction of the Foundation under a Three-Story Brick Building.* (13) Jan. 22.
- Northern Pacific Ice House at Pasco, Wash.* Henry I. Church. (15) Jan. 23.
- Corrosion of Metals and Alloys in Contact. Richard H. Gaines. (14) Jan. 24.
- Various Phases in the Details of Timber Preservation. (Abstracts of papers read before the Wood Preservers' Assoc.) (14) Jan. 24.
- Immense Armory for Eighth Artillery District, New York.* (14) Jan. 24.
- Air Pumps for Injecting Timber Preservatives.* F. J. Angier. (Paper read before the Am. Wood Preservers' Assoc.) (18) Jan. 24.
- Shop Methods which Expedite Field Erection.* Edward J. Knap. (13) Jan. 29.
- A Peculiar Column Failure.* C. I. Auten. (13) Jan. 29.
- Acoustic Effect of Fireproofed Cotton-Flannel Sound Absorbers. F. R. Watson. (13) Jan. 29.
- L'Assèchement des Terrains Aquifères. Th. Verstraeten. (31) Pt. 3, 1913.
- Oscillations et Vibrations Mécaniques à Périodicité Variable.* F. Brousseau. (32) Nov.
- Deuxième Complément à l'Etude de la Flexion dans les Pièces de Ciment Armé (Etude Economique). L. Lebrech. (32) Nov.
- Changements de Dimensions avec le Temps du Béton Armé ou Non.* M. Mesnager. (43) Nov.

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- Turnhalle des "Allgemeinen Turnvereins E. V." zu Leipzig. G. Asseman. (51) Serial beginning Sup. No. 1.
- Anschauliche Lösungen einiger statisch unbestimmter Aufgaben.* R. Baumann. (48) Nov. 29.
- Die Konstitution des Portlandzementklinkers. Edward D. Campbell. (80) Dec. 6.
- Beitrag zur Statik der Führungsgerüste von Gasbehältern.* K. Löhle. (107) Dec. 6.
- Verwendung von Tonschlamm zur Massebereitung. Karl Jacob. (80) Dec. 11.
- Umschnürter Gusselisenbeton.* (80) Dec. 13.
- Ein schiefer Getreidespeicher.* (80) Dec. 13.
- Voll- und Mantelschornsteine. N. Peters. (80) Dec. 13.
- Knickungsversuche mit Eisenbetonsäulen.* C. Bach. (48) Dec. 13.
- Rissebildung, Unterhaltung u. Lebensdauer von Eisenbetonbauten.* (80) Dec. 18; (Discussion) W. Petry. (80) Jan. 6.
- Die Elektrizität auf den Bauplätzen der Grossstädte.* Rudolf von Erhardt. (51) Dec. 20.
- Schutz der Gebäude gegen Grundfeuchtigkeit und Tageswasser. Piehl. (39) Dec. 20.
- Das Sanatorium Adelheid in Unter-Aegeri, Kanton Zug.* (107) Dec. 20.
- Neue Pfahlschuhform für Holzbohlen.* F. Lang. (40) Dec. 20.
- Vergleichende Mörteluntersuchungen an Mauerwerkkörpern.* Leo Bloch. (80) Dec. 23.
- Belastung von Spundwänden aus Larssen-Eisen.* Karl Bernhard. (40) Dec. 24.
- Aeussere und innere Spannung in Eisen- und Stahlguss und ihre Beseitigung. Bernhard Osann. (50) Dec. 25.
- Halle der Wissenschaftlichen Abteilung auf der Leipziger Baufach-Ausstellung 1913.* Franz Czech. (69) Jan.
- Der Neubau der Teudloff-Dittrich Budapester Armaturen- Pumpen- und Maschinenfabrik A.-G. Budapest.* Friedrich Bleich. (69) Serial beginning Jan.
- Eisenbeton unter dem Einfluss elektrischer Ströme.* Kurt Lubowsky. (41) Serial beginning Jan. 1.
- Das Wiener Konzerthaus.* Baumann, Fellner und Helmer. (53) Jan. 2.
- Wettbewerb für das Verwaltungsgebäude der Schweiz. Unfallversicherungsanstalt in Luzern.* (107) Serial beginning Jan. 3.
- Zur Frage der wirtschaftlichen Höhe des Plattenbalkens.* Max Mayer. (78) Jan. 3.
- Der Einfluss der Nachgiebigkeit des Baugrundes auf die Berechnung äusserlich statisch unbestimmter Bauwerke.* Brugsch und Briske. (78) Serial beginning Jan. 3.
- Zeichnerische Untersuchung der Vierendeelträger mit parallelen Gurten.* Béla Enyedi. (78) Jan. 3.
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- Schliessstandanlage aus Eisenbeton.* G. Feurer. (78) Jan. 3.
- Beitrag zur Theorie von Deformationswinkel und deren Anwendung zur Berechnung statisch unbestimmter Tragwerke.* Otto Kozeny. (53) Serial beginning Jan. 10.
- Die graphische Untersuchung des kontinuierlichen Balkens mit veränderlichem Trägheitsmoment auf elastisch Stützen.* A. Ritter. (107) Jan. 10.
- Standfestigkeit von gemauerten Schornsteinen.* (80) Jan. 13.
- Eine neue Form des Wölbeckens.* K. Löhle. (107) Jan. 17.

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- Method of Locating Leaks in Water Mains.* F. J. Hoxie. (28) Sept.
- The City Tunnel and Conduits of the Catskill Aqueduct.* Walter E. Spear. (28) Sept.
- The Additional Water Supply for the City of Pittsfield, Mass.* Hiram A. Miller. (28) Sept.
- Torresdale Filter Plant: Methods and Results, 1907-1913.* Francis D. West and Joseph S. V. Siddons. (28) Sept.
- Notes on Water Waste Prevention Work in New York City. William W. Brush. (28) Sept.
- Water Purification in Illinois.* Edward Bartow and Paul Hansen. (4) Dec.
- The New Water Plant of South Orange, N. J. (60) Jan.
- Surge in a Hydraulic Stand Pipe with Overflow.* Irving P. Church. (36) Jan.
- Theory of the Tangential Water Wheel.* R. L. Daugherty. (36) Jan.
- Water Sterilization Plants.* (60) Jan.
- Description of Friar Waddon Borehole Scheme and Pumping Station. R. Stevenson Henshaw. (Paper read before the Inst. of Water Engrs.) (104) Serial beginning Jan. 2; (66) Jan. 6.
- Some Structural Features of the New Water Supply Works at Riverside, California.* (86) Jan. 7.
- The Hydraulic Laboratory at Syracuse University.* Paul C. Nugent. (13) Jan. 8.

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- Designing Water Conduits of Large Diameter.* A. C. Janni. (13) Jan. 8.
 Montreal's Water Supply System and Its Recent Failure.* (96) Jan. 8.
 The Treatment of Plumbo-Solvent Water by Means of Mechanical Filters. Frederic John Dixon. (Paper read before the Institution of Water Engrs.) (104) Jan. 9.
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 Water Softening and Purification. H. J. DeQ. Lenfestey. (Abstract of paper read before the Nottingham Eng. Soc.) (47) Serial beginning Jan. 9.
 Constructing the Kensico Dam.* George T. Seabury. (14) Jan. 10.
 Big Creek Hydroelectric Development.* (14) Jan. 10.
 New Waterwork for Springfield, Illinois, Driven Wells Instead of Filter Chosen for Sake of Economy. (14) Jan. 10.
 Reinforced-Concrete Standpipe with Sliding Base. William Mueser, M. Am. Soc. C. E. (14) Jan. 10.
 Mitigating Electrolysis from Street-Railway Currents. E. B. Rosa and Burton McCullom. (14) Jan. 10.
 Design of the Proposed Aqueduct for the Additional Water Supply of Winnipeg, Manitoba.* (Abstract of a report by Rudolph Hering, Frederic P. Stearns and James H. Fuertes to the City of Winnipeg.) (86) Jan. 14.
 A Complete Accounting System for Both Large and Small Water-Works Properties. LeRoy W. Allison. (86) Jan. 14.
 The Coquitlam-Buntzen Hydro-Electric Development.* G. R. G. Conway. (96) Jan. 15.
 Progress on the Catskill Water Supply, New York City.* (13) Jan. 15.
 The Artesian Water Supply of Australia.* (12) Jan. 16.
 Hydro-Electric Engineering in Peru.* William T. Taylor. (12) Jan. 16.
 Some Notes on Water Supply in the Rural District of Atherstone. H. J. Coleby. (Paper read before the Inst. of Mun. and County Engrs.) (104) Jan. 16.
 Coon Rapids Hydroelectric Development.* (14) Jan. 17.
 Filling and Emptying of Reservoirs.* Theodore R. Running. (14) Jan. 17.
 Jordan River Dam on Vancouver Island.* (14) Jan. 17.
 Two Recent Southern Hydro-Electric Developments.* George G. Shedd. (Paper read before the Am. Assoc. for the Advancement of Science.) (64) Jan. 20.
 Report on Proposed Extensions of Toronto's Water-Works System.* (96) Jan. 22.
 The Discharge Capacity of Semi-Circular Steel Flumes.* E. A. Moritz. (13) Jan. 22.
 Construction Features of the Stony River Hollow Concrete Dam.* G. H. Bayles. (13) Jan. 22.
 Break in the Stony River Dam.* (13) Jan. 22; (14) Jan. 24.
 Proposed Additional Water Supply for Paris, France. (13) Jan. 22.
 Corrugated-Iron Construction on the Sacramento Valley Irrigation Project.* Eugene C. Mills. (13) Jan. 22.
 Collapse of Groined-Arch Roof at the Belmont Filters in Philadelphia.* (14) Jan. 24; (13) Jan. 15.
 Tallulah Falls Hydro-Electric Development.* Warren O. Rogers. (64) Jan. 27.
 Method of Making a General Investigation and Efficiency Test of the Lorain, Ohio, Water-Works, Results and Recommended Improvements. Phillip Burgess. (Report made to the City.) (86) Jan. 28.
 Lawrence Experiment Station Studies in the Purification of Water. H. W. Clark and Stephen De M. Gage. (Report to the State Board of Health of Mass.) (86) Jan. 28.
 Management of Irrigation Systems.* Robert S. Stockton, M. Am. Soc. C. E. (86) Jan. 28.
 Tallulah River Development of the Georgia Railway and Power Company.* (13) Jan. 29.
 Relation of Purity of Water-Supply to Typhoid Fever at Cincinnati, Ohio. J. W. Ellms. (Abstract from *American Journal of Public Health*.) (13) Jan. 29.
 Largest Motor-Driven Irrigation Pumping Plant. (Gem Irrigation District, Western Idaho.)* (27) Jan. 31.
 Strength of Large Pipes.* D. R. Cooper. (14) Jan. 31.
 Measuring Turbine Discharges with Salt Solutions, Chemical Analysis Gives Results Accurate Within 0.1 Per Cent. Abraham Streiff. (14) Jan. 31.
 Usines Hydro-Electriques d'Augst et de Wyhlen, Le Barrage d'Augst sur Rhin, près de Bâle.* F. Loppé. (33) Serial beginning Jan. 3.
 Neuzettliche Wasserwerks-Pumpmaschinen.* Otto F. Bruman. (48) Serial beginning Nov. 22.
 Ueber die Festigkeit der Wasserbauhölzer. Troschel. (40) Dec. 20.
 Wasserleitungen von Pergamon.* Schulze-Gahmen. (40) Jan. 3.
 Die Talsperre im Geigenbachtale.* Fleck. (39) Serial beginning Jan. 5.
 Die grossen Bewässerungsarbeiten der Vereinigten Staaten. (53) Jan. 9.
 Die hydrometrische Versuchsanstalt in Santhià (Provinz Novara), Italien.* A. Budau. (53) Jan. 9.

*Illustrated.

Waterways.

- The Relation of Rainfall to Run-Off in American Rivers. W. F. White, Jr. (6) Nov.
- The Port of New Orleans.* C. O. Sherrill. (100) Jan.
- The Colbert Shoals Canal, Tennessee River, Alabama.* H. Burgess. (100) Jan.
- Concrete in Sea Water on New England Coast. Frederic V. Abbott, M. Am. Soc. C. E. (100) Jan.
- Concrete Laid in Freezing Weather, New York State Barge Canal. D. A. Watt, M. Am. Soc. C. E. (100) Jan.
- The Panama Canal.* (86) Jan. 7.
- Protecting East St. Louis Against Floods.* Tampton Aubuchon. (46) Jan. 10.
- Foreign Ladder Dredges.* (13) Jan. 15.
- The Soo Canal.* Harry Chapin Plummer. (19) Jan. 17.
- Enclosing and Partial Draining of the Zuider Zee.* W. J. L. Klehl. (46) Jan. 24.
- Buenos Aires and Some Minor Argentine Ports.* F. Lavis. (13) Jan. 29.
- Construction Details of Lock and Dam No. 19, Ohio River.* (13) Jan. 29.
- Concrete Troughs on the Barge Canal.* George C. Mills. (14) Jan. 31.
- Ministère des Travaux Publics; XII^e Congrès International de Navigation tenu à Philadelphie en 1912, Rapports des Délégués Français sur les Travaux du Congrès. (43) Serial beginning Nov.
- La Voie Navigable de Berlin à la Baltique, Canal de Berlin à Stettin, par l'Oder.* (33) Dec. 27.
- Bagger und Baggergeräte für die Kaiserliche Hafenbauabteilung Helgoland.* Behn. (48) Nov. 22.

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